The Iron Age

A Review of the Hardware and Metal Trades.

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The Crampton Puddling Furnace.

From articles published in these columns, from time to time, during the past two years, our readers have been kept acquainted with the progress made by Mr. T. R. Crampton in the use of powdered fuel for heating purposes. We now lay before them an account of the application of this principle to the puddling furnace, condensed from a recent issue of *Engineering*.

Mr. Crampton's rotary furnace is marked by several important features which distinguish it clearly from its predecessors, and to these features we shall now direct attention. It consists of but a single chamber lined with oxide of iron, this chamber containing the iron to be treated, and forming a gas producing chamber, a combustion chamber and a working chamber, the combustion of the fuel being commenced and ended in it. In his earlier revolving puddling furnace Mr. Crampton employed two chambers separated by a neck or kind of annular bridge, the one of these chambers containing the metal, and the other forming a kind of preliminary combustion chamber. Experience with this arrangement showed, however, that two chambers were unnecessary.

As now constructed Mr. Crampton's puddling furnace consists of a wrought iron casing 6 ft. 8 in. in diameter outside, and about 6 ft. 9 in. long, this casing being made double, so that a water space is formed both at the sides and ends, as shown in Fig. 1. To the center of one end, or what we may term for convenience the back of the furnace, is attached a two-way cock, which communicates with two wrought iron pipes contained within the water space. Through one of these pipes the incoming water is conducted direct to the front of the furnace, while through the other the heated water escapes at a temperature of about 90°. The exit pipe extends radially to the casing, and the heated water is received into it through an opening close to the periphery of the furnace. This arrangement is adopted to insure the casing being cleared of air, the opening in the exit pipe coming into the highest position once during each revolution of the furnace, and any air which may have collected being then discharged through it. The slightly heated water on escaping from the two-way cock is conducted through an oblique 1¼ in. pipe to the front of the furnace, where it is led through a short length of India rubber pipe to the movable flue piece, of which we shall speak presently. This flue piece is also furnished with a water casing, and through it the water from the furnace circulates before being finally run to waste.

The water casing is one of the chief features of Mr. Crampton's furnace, and a most important feature it is. The amount of protection from injury which this water casing affords is, in fact, far greater than would have been generally deemed possible had it not been demonstrated by practical experience. So great is it that Mr. Crampton's first furnace has been worked with as much as from 16 to 18 square feet of the plate surface at the ends left entirely uncovered by lining, and this without any injury ensuing. A good measure of the efficiency of the water casing is, moreover, afforded by what takes place at the neck of the furnace, where the action of the heated gases is necessarily most intense. It is found in practice that it is never necessary to attend to the lining of this portion, as the neck itself, being kept cool by the water, chills the liquid cinder which comes into contact with it, and in this way a protective coating of sufficient thickness is always maintained. In fact, if a piece of the lining of the neck be broken off at the commencement of a heat, it will be completely renewed before the heat is finished.

The furnace, as shown in Fig. 1, is at the back end completely closed by the water casing, while at the front end there is left the opening, or neck, of which we have just been speaking. To this opening is fitted the movable flue piece to which we have already incidentally referred. This flue piece consists of a double casing through which water circulates as already explained, this casing being lined with refractory material, and being of such form that when closed it connects the mouth or neck of the furnace with the adjacent chimney. The flue piece is hinged to a cast iron column fixed to the same base plate as the furnace itself, the hinge bracket not being attached directly to the column, but fitting a block which turns on the column, as shown in Fig. 1. From this view it will be seen that the hinge can, by means of a screw and hand wheel, be made to slide on the block just mentioned, and the flue piece thus be effectually tightened up against the face surrounding the mouth of the furnace. This arrangement is a very ingenious and efficient one. At the side opposite to the hinge the flue piece is also tightened up by a screw and hand wheel, as shown. That portion of the weight of the flue piece which is not carried by the hinge rests upon a light cast iron wheel, which runs on the base plate carrying the furnace, and the axle of which is carried by a bracket bolted to the bottom of the flue piece. It may be noticed, also, as a neat little detail, that the water discharge pipe from the water casing of the flue piece empties itself into an annular trough, which surrounds the column to which the flue piece is hinged. The arrangement thus provides for the waste water being received by the trough during the whole time the flue piece is being swung open or closed.

The main body of the furnace is hooped at two points by steel tyres, these tyres each taking a bearing upon a pair of carrying wheels. These carrying wheels, or rollers, turn in bearings supported by plummer blocks fixed to the large cast iron base plate which carries the whole furnace. The turning gear of the furnace is very simple, and consists merely of a worm wheel fixed to the hind end, this wheel being geared into by a worm driven direct by one of Messrs. Brotherhood & Hardingham's handy little three-cylinder engines.

Eight furnaces are disposed in a circle—or rather octagon—their mouths being outward and their fuel distributing apparatus in the center. Each furnace with its engine complete stands on a large cast iron base plate, this bed plate being simply laid on the surface of the ground after the latter has been prepared to receive it. These bed plates are laid with a slight slope downward toward the center of the ring of furnaces, and a general drain—forming an octagon in plan—receives any water that may be spilt about the furnaces. Loose perforated plates cover this drain. The floor plates inside the octagon formed by the drain are also laid with a downward slope toward the latter. Outside the ring of furnaces the flooring plates are continued as shown in the plan, so as to form altogether an octagon measuring 83 ft. over its sides, and on this surface are fixed eight cranes, these being so situated that each serves two furnaces. In the event of any crane breaking down, therefore, the furnace to which it properly belongs can be temporarily served by the crane belonging to the next furnace.

Altogether the group of eight furnaces with their cranes occupy an area of 100 ft. square, this area being covered by a roof with three spans; namely, a central one of 42 ft. and two side spans of 29 ft. each. At one corner of the area just mentioned is space for a couple of cupolas; a second corner contains the reservoirs for the powdered fuel, while the two others accommodate steam hammers. The whole arrangement has been carefully and skilfully worked out, and its mechanical details are excellent.

We have already referred incidentally to the position of the reservoirs for the powdered fuel, and we must now explain how the latter is distributed to the furnaces. In the arrangement represented by the plan, Fig. 2, the grinding apparatus is contained in the building shown in the upper right hand corner, and the ground fuel is delivered into an iron reservoir containing a couple of revolving vertical shafts carrying stirrers. The grinding of the coal, we may remark here, can be performed by ordinary mill stones, but Mr. Crampton does not confine himself to any particular mode of grinding. From the reservoir just mentioned the coal dust is taken by a screw or creeper which delivers it to an elevator, which raises it and delivers it to a second screw extending obliquely to the center of group of furnaces. In fact, the coal dust is conveyed by the employment of ordinary flour mill apparatus, no novel kind of machinery being required. At the center of the group the fuel is received by a small cylindrical tank. Within this tank is a vertical shaft carrying stirrers, this shaft being driven by a bevel wheel at its upper end gearing into a bevel pinion at the end of the shaft of the feeding screw. Outside the tank is another vertical shaft, which is geared to the bevel wheel already mentioned, and from this vertical shaft is driven the feeding apparatus which supplies the powdered coal to the various furnaces.

At first sight the fuel-feeding apparatus may appear rather complicated; but a little explanation will, we think, show that it is really as simple in its construction as it is certain and effective in its action. The reservoir of powdered fuel is mounted on the top of another reservoir, 5 ft. in diameter, which forms an air vessel, and to which a supply of air is furnished by a fan situated near the fuel-grinding apparatus. From this air reservoir there radiate eight blast nozzles—one for each furnace—these nozzles being each 4 in. in diameter at their outer ends, and each delivering the air into a pipe 6 in. in diameter, and furnished with a bell-mouth. Each blast nozzle is furnished with a throttle valve worked by a rod which extends to the furnace to which the the nozzle belongs.

In the bottom of the central reservoir for the powdered fuel are eight openings—one corresponding to each of the blast pipes, already mentioned—and through these openings the fuel falls into the eight distributors. The powdered fuel on leaving its reservoir is first agitated and loosened by a set of stirrers, and then passes out on to the surface of a plain roller 10 in. in diameter, revolving at a speed of 20 revolutions per minute. Above this plain roller is another half its diameter, the two rollers being geared together so that they revolve at the same surface speed. The lower, or larger roller, is mounted on a spindle running in fixed bearings; but the axis of the smaller roller is carried by a pair of lever arms fixed on a short shaft which also carries another arm, from the end of which a rod passes off to the furnace to which the feeding apparatus belongs. By means of this rod the upper feeding roller can be raised or lowered through a slight range, and the quantity of fuel passing out between the rollers can thus be exactly controlled. The surfaces of the rollers are kept clean by scrapers, and the powdered fuel passing between them passes down a short spout, and is delivered opposite the trumpet-mouth of the 6-in. air pipe, already mentioned. The induced current produced by the discharge of the blast from the blast nozzle, causes the powdered fuel to be carried into the pipe, and it is thus conveyed, mixed with the air, to the furnace where it is consumed. In the plan, Fig. 2, the eight radial pipes for conveying the air and fuel, are shown branching off to their respective furnaces.

On reaching the furnace to which it belongs each air pipe is connected to an elbow, which can either deliver the mixed air and fuel into the furnace, or which can be turned up out of the way, when the flue piece has to be swung back. We have, on a former occasion, when speaking of Mr. Crampton's system of burning powdered fuel, referred to the difficulty at one time experienced from the separation of the air and fuel which took place whenever the pipe containing the mixture made a sharp bend. When such a bend occurs the momentum of the fuel carries it to the outer side, and if such a separation was allowed to occur just before the delivery of the air and fuel into the furnace, it is evident that one side of the combustion chamber would be furnished with an excess of air, and the other with an excess of fuel. The simple and ingenious way in which this objectional result is avoided by Mr. Crampton, is shown by Fig. 1. The supply pipe, where it makes its final bend in front of the furnace, is divided by a number of vertical partition plates, it being thus practically converted at the bend into a number of parallel pipes of rectangular section. In each of these pipes or channels the air and coal separate to a greater or less extent, but on the currents passing through these channels reuniting, that portion of each jet, which is surcharged with fuel, becomes mingled with the part of the next jet which is undercharged, and so on, the result being that the combined jet discharged into the furnace, is practically uniformly charged with fuel throughout its section.

The jet of mixed air and fuel is discharged into the furnace through a rectangular nozzle 12 in. wide and 3 in. high, the opening in the flue piece through which the jet enters being fitted with a number of flaps or doors arranged one above the other, so that the one or the other of these can be turned back and the jet inverted at any desired height. At the right hand side of the front of each furnace is placed

[Concluded on page 5.]

Fig. 1.

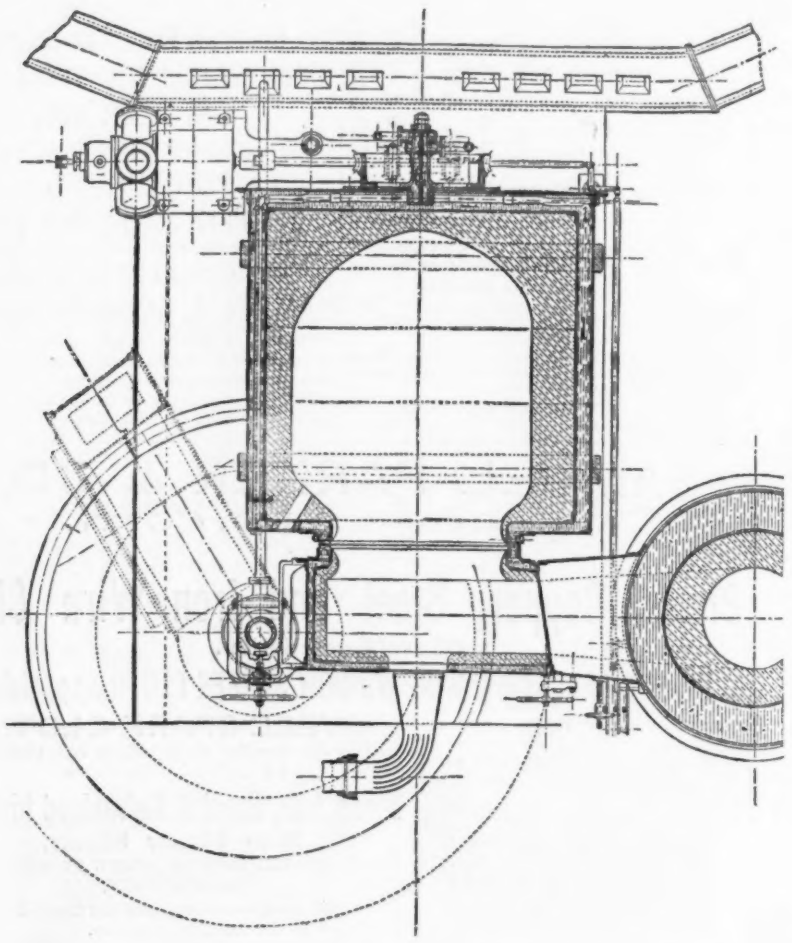
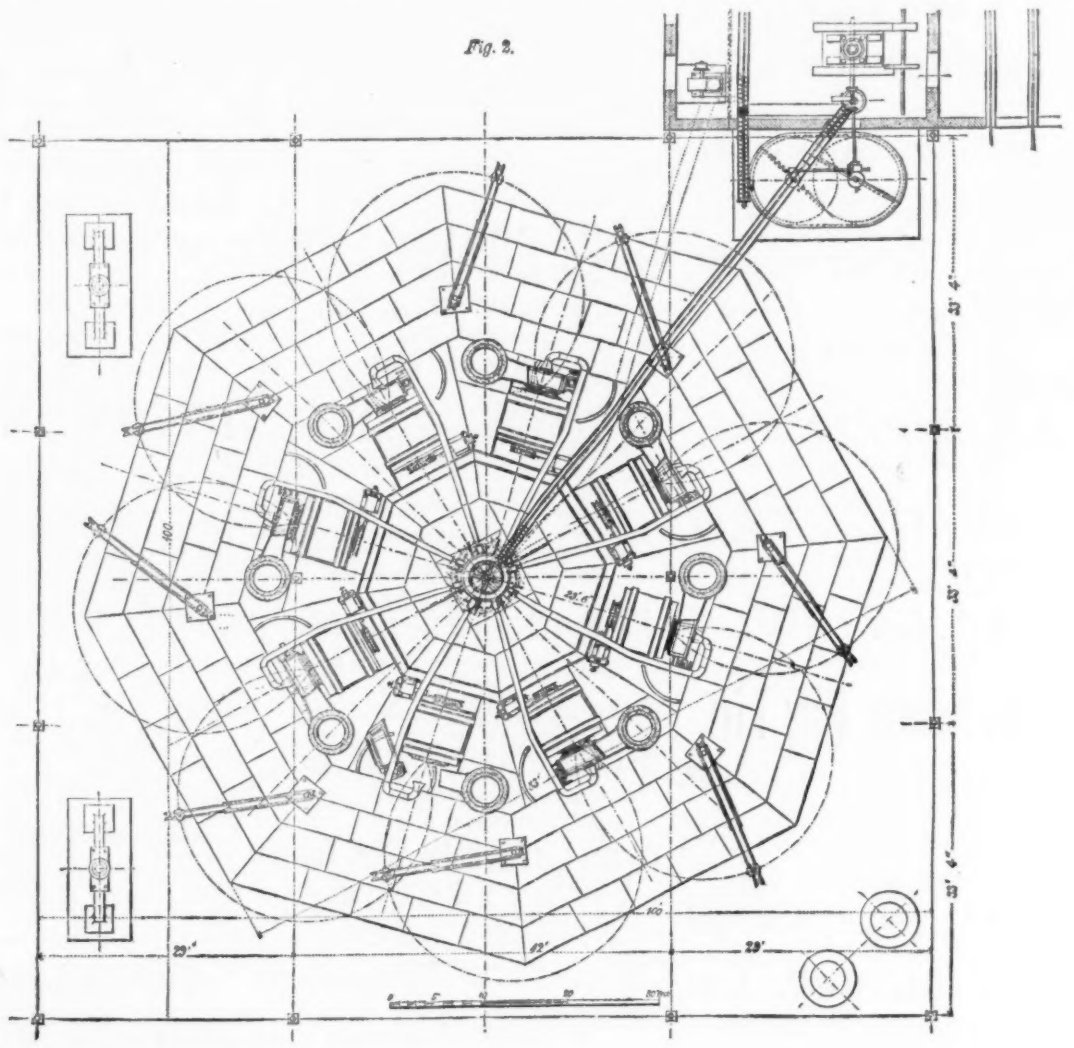


Fig. 2.



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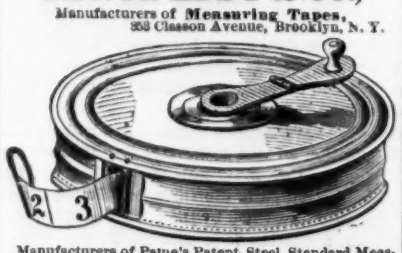

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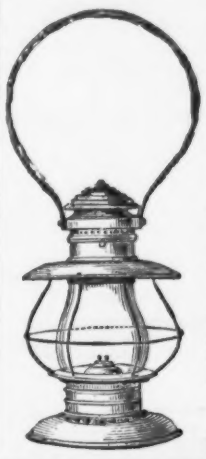

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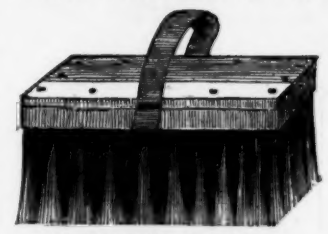

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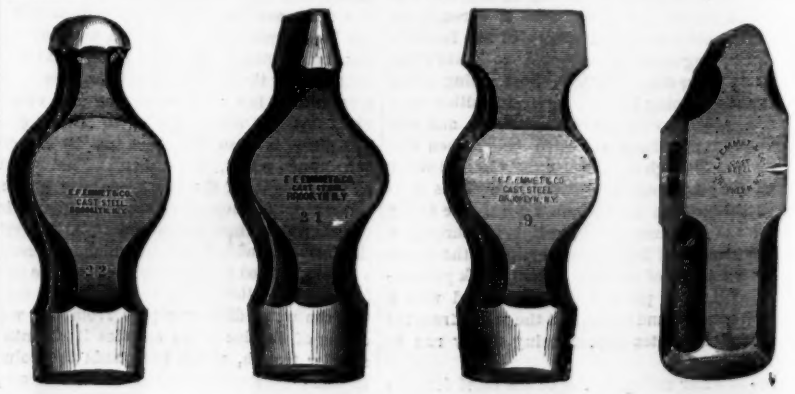

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The advertiser respectfully refers to the following establishments in which his welding compound is exclusively used: TERWILLIGER & Co., Safe Makers, New York; TRENTON VISE & TOOL WORKS, Trenton, N. J.; BENJ. ATHA & Co., Newark Steel Works, Newark, N. J.; WASHOE TOOL MFG. CO., Elm Park, Staten Island; CYRUS CURRIER & Co., Engine Builders, Newark, N. J.; JERSEY CITY STEEL WORKS, J. R. Thompson & Co., Jersey City, N. J.; GRANT LOCOMOTIVE WORKS, Paterson, N. J.; DELAMATER IRON WORKS, N. Y.; DELAWARE AND LACKAWANNA RAILROAD CO.

H. SCHIERLOH,

24 Exchange Place, Jersey City, N. J.

AGENTS:

WYETH & BRO., Baltimore, Md.; PANCOAST & MAULE, Philadelphia, Pa.; CYRUS CURRIER, Newark, N. J.; R. POTT, 130 Smithfield St., Pittsburgh, Pa.; W. W. KERR, 59 Dearborn St., Chicago, Ills.

BUCK BROTHERS,

MILLBURY, MASS.

Most complete assortment in the U. S. of **Shank, Socket Firmer, and Socket Framing**

CHISELS.

Gouges of all lengths, and circles beveled inside or outside. Nail Sets, Scratch and Belt Awls, Chisel Handles of all kinds. Orders filled promptly, generally same day as received.

"SCANDINAVIAN SECURITY PAD LOCKS."

The best and handsomest locks in the market. The Case and Cap are made of malleable iron, and the shackle case hardened. Prices lower than on any other lock *with shoulder on shackle upon the market.*

G. N. STEARNS & CO., Syracuse, N. Y.

New York Agents, HUBBARD & CURTISS MFG. CO., 82 Chambers St.

NORWICH LOCK MFG. CO.,

NORWICH, CONN.

Agencies:

Adams, Bullard & Co., 19 Oliver St., Boston.

I. G. Brenner, Son & Co., 21 North 5th St., Phila.

F. H. Davidson, 158 Franklin St., Baltimore.

Schweitzer Mfg. Co.,

57 Reade St., N. Y.

IMPORTERS & JOBBERS.

PRICE, $4.50 per hundred.

The Sugar Maker's Friend.

More agents wanted to canvass for the sale of **Post's Patent Galvanized Metallic Eureka Sap Spout and Bucket Hanger.** Samples, Circulars and Terms sent on receipt of 20cts to pay postage. Address, C. C. Post, Manufacturer & Patentee, Burlington, Vt.

Patented, Dec. 31, 1867, May 1868 Released

Olmstead's Late Improved Patent Double Seaming and Deflecting Machine.

The patentee of the above machine, after an experience of 15 years in the manufacture and sale of double-seamers and other tinners' tools, now offers to tinners this machine, which will double seam all kinds of straight, flaring and oval work, coffee pots, &c., &c. It works readily on the lightest and heaviest grades of tin plate and other sheet metal. It is strong and handsomely made and is warranted. This is the best and cheapest seamer ever offered to tinners. For full particulars send for circular. Price only $25.

W. L. HEADLEY, Manufacturer,
35 William Street, N. Y.

Also manufacturer of Olmstead's Combined Double Seamer, Setting Down and Deflecting Machine. Also Waugh's Circular Shears.

ROCKY MOUNTAIN VERMILION PAINT CO. Trade Mark.

THE

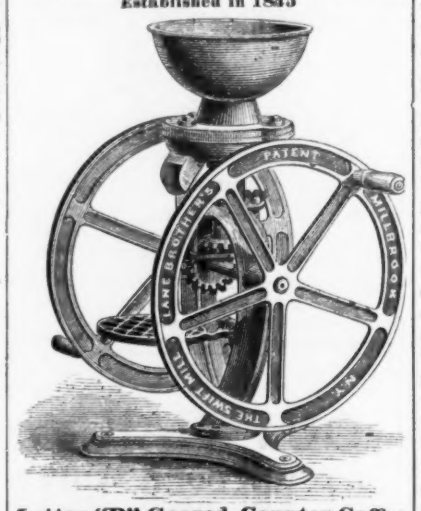
Rocky Mountain Vermilion Paint

Is "Nature's Compound" of Copper, Mercury, Lead and Iron. A pure Oxide of Metals, containing no earthy matter, hence we claim and are prepared to *prove* that it is the Best and Cheapest Paint in the market. Properly mixed, we will guarantee it to cover double the surface and wear twice as long as ordinary paints. It will not Peel, Scale, Crack or Blister, though subjected to high degrees of heat. It will effectually Prevent the Corrosion of Metals, even in mid ocean. Warranted superior to red lead or any other lead, for any and all purposes for which paint is required. Please send for circulars.

All orders should be addressed, **Wm. H. Corey**, General Agent, 20 Sabin St., Providence, R. I.

The Swift Mill.

Established in 1845



Letter "B" Geared Counter Coffee or Spice Mill.

Stands nearly 2½ feet high. Is highly finished, color deep Vermilion and Gold. We make more than 20 different styles and sizes.

Send for catalogue. Manufactured exclusively by

LANE BROTHERS, Millbrook, N. Y

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MANUFACTURERS OF

Japanned and Patent Bright Metal

BIRD CAGES,

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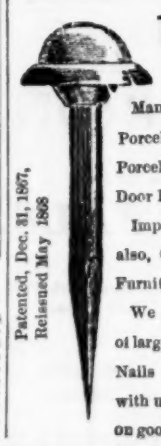
Office and Salesroom, No. 254 Pearl St., New York Factory, Nos. 252, 254 & 256 Pearl Street



T. C. RICHARDS & CO.,

47 Murray Street, N. Y.,

Manufacturers of Richards' Patent Porcelain-head Picture Nails; also, Porcelain Picture, Drawer, Shutter, and Door Knobs, etc., etc.

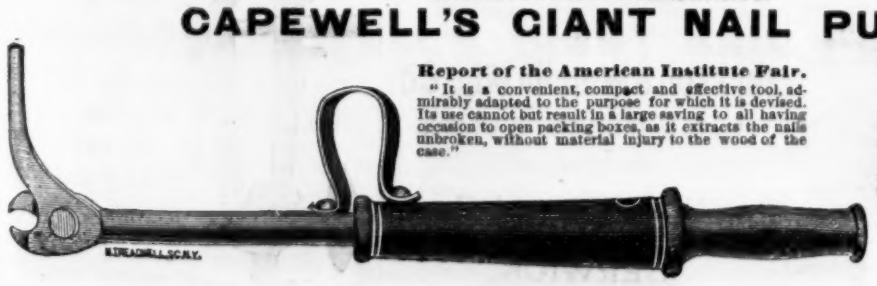
Importers of German Brass Goods, also, China, Gilt, Steel, and Silvere Furniture Nails Wire Nails etc,, etc.

We particularly invite the attention of large buyers to our Patent Picture Nails and Knobs being a specialty with us, we offer satisfactory discounts on good orders.

MALTBY, CURTISS & CO., Waterbury, Conn.,

Manufacturers and Sole Proprietors of

CAPEWELL'S GIANT NAIL PULLER.



Report of the American Institute Fair.

"It is a convenient, compact and effective tool, admirably adapted to the purpose for which it is devised. Its use cannot but result in a large saving to all having occasion to open packing boxes, as it extracts the nails unbroken, without material injury to the wood of the case."

Reasons why you should Use the Nail Puller.

1st. The edges of the boxes are never split or injured. 2d. No broken Nails in the box or cover. 3d. The box and cover remain sound for future use. 4th. Nails are drawn without breaking or bending. 5th. The box can be opened in half the time required by the old method with chisel or crane. Send for prices, and other information, to

MALTBY, CURTISS & CO.,

Hardware Commission Merchants,
62 Reade St., N. Y.

Answers to Correspondents.

"A subscriber" asks for a formula for testing lead ore into which silver enters as a constituent.

Answer.—If the correspondent desires to ascertain simply the presence of silver in lead ore the following process will serve the purpose: Dissolve a portion of the ore in pure nitric acid. Take a small portion of the solution as a sample, and dilute this with water; then add hydrochloric acid. If no precipitate is formed then there is no silver present. If a precipitate does form, then silver is present, unless there is any mercury in the substance. This seldom appears in lead ore, but the question may be settled by taking the larger portion of the solution of the ore in nitric acid and treating it with hydrochloric acid. A precipitate will be thrown down, and this should be filtered. The precipitate should be thoroughly washed, and then hot water should be poured upon it, and the fluid that escapes below should be tested with sulphuric acid for lead until none is detected. Then pour over the precipitate ammonia, and if the color of the precipitate is changed to black or gray it is a proof of the presence of suboxide of mercury. If no discoloration takes place the latter is absent.

To determine the amount of silver present is a much more difficult question. Several methods are available, and circumstances determine the best one to pursue. If the silver is in very minute quantities the cupel process is the best. Otherwise the following method will answer: Reduce the ore to a fine powder and dry it at 100°. Then weigh out a certain quantity (from one to two grammes) and oxidize it with highly concentrated red fuming nitric acid, free from chlorine and sulphuric acid. For this purpose use a capacious flask, covered during the operation with a watch glass. Take care not to put the tube in which the powder was weighed into the flask. If the acid is sufficiently strong, the sulphur in the ore will be fully oxidized. After the vessel has been warmed gently for a long time, add three or four c. c. of pure concentrated sulphuric acid, which you have previously diluted with a little water, and heat on an iron plate till all the nitric acid has evaporated. Dilute it with water, and then filter. Wash the residue with water containing sulphuric acid, and displace the latter with alcohol. Dry the residue, and then ignite it, after which it is to be weighed. It consists of sulphate of lead, gangue undecomposed by the acid, silicic acid, etc. Heat the whole, or a fractional part, with hydrochloric acid to boiling; let the insoluble matter subside, and then decant the supernatant clear liquid on a filter. Pour a fresh portion of hydrochloric acid on the residue, boil again, and allow the insoluble matter to subside. Then decant and repeat this operation until the sulphate of lead is completely dissolved; finally, place the residue on the filter, and wash with boiling water until every trace of chloride of lead is removed. Dry, ignite and weigh the residue. Subtract the weight found from that of the original residue; the difference expresses the quantity of sulphate of lead which the latter contained. Of this weight 68·36 per cent. is metallic lead.

To determine the silver: The sulphuric acid solution obtained in the foregoing process is free from any weighable trace of lead if the process has been properly conducted. It contains the metals present in the ore, except the lead. To this solution add some hydrochloric acid to precipitate the silver, and when the precipitate is formed keep the fluid for some time in a warm place till the chloride of silver has subsided. The latter is filtered off. It is then to be weighed. Of this weight 75·26 per cent. is pure silver. During the whole operation of determining the silver the substance must be kept from the influence of direct sunlight, or even of diffused daylight.

Mr. V. B. G., of Nevada, writes that there is an abundance of antimonial ore in his State, and asks "what is the most practical mode of preparing antimony in its crude state for the market?"

Answer.—There are no works in the United States devoted exclusively to the smelting of antimony. The market is mainly supplied from Germany and France. Recently the lead works of Utah and Nevada have been smelting large quantities of lead containing considerable proportions of antimony. No attempt is made at the mines to separate the antimony from the lead, which also contains silver, often gold, and generally, though not so welcome, small proportions of arsenic. The bullion is shipped to New York in this condition, and is here subjected to new processes. During this operation the lead containing the precious metals is separated from the lead containing the antimony, and the latter sold for type metal and Babbitt metal. It contains from 50 to 60 per cent. of antimony, and is hard and unfit to be used for pipe. If arsenic is present the quality of the metal is deteriorated.

The presence of lead in the Nevada ores is a serious obstacle to obtaining the antimony in a pure state. In accomplishing this result it is claimed that a portion of the antimony and the lead must be sacrificed. Antimony occurs in the market both as a nearly pure metal, known as the regulus of antimony, and in various compounds known as the glass of antimony, the liver of antimony and crocus. These are mixtures of the sulphide and the oxide of antimony in various proportions. They are used in enameling and glass staining.

The only antimonial ore which can be worked with profit is the sulphide. This compound is found distributed in various minerals, such as quartz. In the reduction the crude ore is picked by hand, and the pieces broken into fragments of about the size of an egg. The ore may be recognized in the broken masses by its leaden, gray color and its crystallization in laminæ and needles. The gangue is removed and melted in crucibles perforated at the bottom and placed in other vessels. As the ore melts it flows through the perforations into the lower vessel unaltered in composition, but freed from the earthy gangues. This is the crude antimony of commerce. This process is the one formerly pursued, and is the simplest. It is, however, attended with considerable loss, as a part of the ore continues to adhere to the gangue after the heating, and a part volatilizes and escapes. The loss is generally over 25 per cent. In a more modern method the ore is melted in a reverberatory furnace, the hearth of which is very concave and formed of sand. In the center of the hearth, at its deepest part, is a top hole which communicates with one of the long sides of the furnace. The ore on being sorted is spread over the hearth of the furnace and then melted. The top hole is stopped by dense coal dust while the reduction is going on. About 300 weight is charged at once and mixed with iron ore, and the mass is occasionally stirred, and after the metal has been tapped the scoriæ are removed and the furnace charged anew. Where the ore is expensive, Overman recommends that it be stamped and washed while crude, to free it from rocky matter, and that the metal be then obtained by direct reduction. In such a case carbonate or sulphate of potash or soda is added, and also fine charcoal powder and iron ore. He recommends a proportion consisting of 42 of iron to 100 of crude antimony, 50 of carbonate of soda and 5 of charcoal. Instead of metallic iron, any kind of pure iron ore may be employed with more charcoal, but its metallic contents should come near the above quantity.

Where the first method is used another process is necessary to obtain metallic antimony. The crude antimony must be mixed with crude tartar, or with carbonate of soda and powdered charcoal, and placed in melting pots, and heated over a furnace. An impure metal is thus obtained called the regulus of antimony. This is again melted with a small proportion of its oxide, to obtain a more nearly pure article.

Wages in the Iron Trades.

The *National Labor Tribune* publishes the following as the rates of wages for iron workers in different districts:

PUDDLING.

Puddling at Pittsburgh is $7 per ton of 2240 lbs., with the hot dollar.

	Price for boiling.
For 100 pounds	$0·31
For 200 "	·62½
For 300 "	·94
For 400 "	1·25
For 500 "	1·56
For 1000 "	3·12

RAIL MILL PRICES FOR PUDDLING.

	Per ton.
Baltimore, Md	$5·05
Allentown, Pa	4·50
South Bethlehem	5·00
Phœnixville, Pa	4·75
Cumberland, Md	5·05
Johnstown	5·08¼
Reading (boiled iron)	5·00
South Bethlehem	5·50
Pittsburgh "	6·00
Cleveland "	6·00
Joliet "	7·00
Chicago "	6·55
Columbus "	6·55
Elmira, N. Y	4·75

When iron is 3 9-10 cents a lb. boiling is $6·90 a ton.

"	"	3 8-10	"	6·80 "
"	"	3 7-10	"	6·70 "
"	"	3 6-10	"	6·60 "
"	"	3 5-10	"	6·50 "
"	"	3 4-10	"	6·40 "
"	"	3 3-10	"	6·30 "
"	"	3 2-10	"	6·20 "
"	"	3 -10	"	6·10 "
"	"	3	"	6·00 "

WAGES AT PITTSBURGH BAR MILLS.

Heating and Rolling	76 cents per ton.
Catching	48 cents per ton.
Heaving up	$2·00 per day.
Straightening	2·10 per day.
Dragging down	2·00 per day.

Eight heats for a day's work.

ROLLERS' CARD.

Card Rates.	Wages.	Card Rates.	Wages.
5 8-10	$1·26	4 5-10	$1·00
5 7-10	1·24	4 4-10	·98
5 6-10	1·22	4 3-10	·96
5 5-10	1·20	4 2-10	·94
5 4-10	1·18	4 1-10	·92
5 3-10	1·16	4	·90
5 2-10	1·14	3 9-10	·88
5 1-10	1·12	3 8-10	·86
5	1·10	3 7-10	·84
4 9-10	1·08	3 6-10	·82
4 8-10	1·06	3 5-10	·80
4 7-10	1·04	3 4-10	·78
4 6-10	1·02	3 3-10	·76

Nail plate rolling, 10 cents per ton less than bar rolling.

PRICES FOR BOILING.

List of Prices—Merchant Mill.

	Per ton
First District, comprising Pittsburgh, Leechburgh, Johnstown and Apollo	$6·00
Second District, comprising Wheeling, Steubenville, Ironton, Irondale, Columbus, Zanesville and Cleveland	6·25
Third District, comprising Covington, Newport, Portsmouth, Newark, Cincinnati Louisville, and vicinity, Indianapolis, Belleville, St. Louis and Terre Haute	6·50
Fourth District, comprising Chicago, Joliet, Milwaukee, Wyandotte, Springfield	7·00
Buffalo, N. Y., Niagara Falls forge	5·75
Fifth District, Troy, New York (six heats per ton)	4·80
Boiling iron (five heats)	5·25
Paterson, New Jersey	5·75
Oxford furnace	5·00
Trenton, New Jersey	5·55
Phœnixville, Pa	5·25
Allentown Glen Mill	5·25

Pittsburgh is paid $1 per ton above this list, and all places controlled by it.

Eastern Pennsylvania and New Jersey are ruled by Philadelphia prices (helper paid 50 cents out of office,) 5·25 per ton.

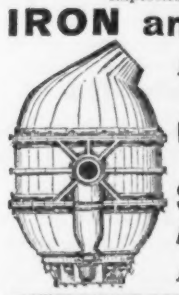
Welding Compounds.—A correspondent in a Western town sends us a recipe for making a compound for welding steel. It is as follows: 6 oz. copperas, 4 oz. lamp black, 1½ lbs. salt, 3 oz. prussiate of potash, ½ oz. iodide of potassium, 1 oz. plumbago, 10 lbs. iron filings, 3 oz. oxide of manganese, 1 lb. caustic soda, 2 oz. sulphate of copper, 3 oz. iron rust, 3 oz. litharge, 2 lbs. borax, and 25 lbs. white sand. We have not tested the compound, but are much obliged for the recipe. If we may venture a suggestion, we should say that the compound might be improved by adding 2 lbs. green tea; 2 papers fine cut chewing tobacco; 1 pint of vinegar; 1 oz. red pepper, and sugar to taste. These ingredients would certainly do no harm, and, perhaps they might improve the compound.

Iron.

NEW YORK.

GA M'L G. SMITH & CO.,
IRON WAREHOUSE,
342, 344 & 346 Pearl Street, New York.,
Importers and Dealers in
IRON AND STEEL,
COMMON AND REFINED BAR IRON,
SHEET AND PLATE IRON,
Rod, Hoop, Band, Scroll, Horse Shoe, Angle and Tee Iron,
PIG IRON,
OLD RAILS,
WROUGHT IRON BEAMS.
Iron of all sizes and shapes made to order.

PIERSON & CO.,
Iron Warehouse,
24 Broadway, 77 & 79 New St.,
NEW YORK CITY.
IRON and STEEL,
Common and Refined Iron Rods, Hoops, Bands, Scrolls, Horse Shoe, Ovals, &c., &c.
Swedes, Norway, Lowmoor & Bagnalls.
Orders filled from stock at lowest prices.

JACKSON & CHACE.
206 & 208 Franklin St., N. Y.,
Importers and Dealers in
IRON and STEEL.

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JOHN A. GRISWOLD & CO'S
Bessemer Steel.
MACHINERY STEEL,
Cast Steel and
SPRING STEEL,
ANGLE and T IRON.
Special Irons for Bridge and Architectural Work.

ABEEL BROTHERS,
Successors to JOHN H. ABEEL & CO.,
Iron Merchants,
190 South Street and 365 Water, N. Y.
ULSTER IRON
A full assortment of all sizes constantly on hand.
English and American Refined Iron of choicest brands.
Common Iron.
Band, Hoop and Scroll Iron.
Sheet Iron.
Norway Nail Rods.
Norway Shapes.
Cast, Spring and Tire Steel, etc.

A. R. WHITNEY. J. HENRY WHITNEY.
A. R. Whitney & Bro.,
Manufacturers of and Dealers in
IRON,
56, 58 & 60 Hudson, 48, 50 & 52 Thomas, and 12, 14 & 16 Worth Sts., } NEW YORK.
Our Specialty is in
Manufacturing Iron
Used in the Construction of
Fire-Proof Buildings, Bridges, &c.
AGENCY OF
Abbott Iron Co. Boiler Plate & Tank Iron.
Glasgow Tube Works Boiler Flues.
Pencoyd Iron Works Shafting.
Passaic Rolling Mill Angles and Tees.
A. R. Whitney & Bro.'s Rivets.
Whitney's Best Bar Iron.
Whitney's Wrought Iron Beams and Channel Iron.
Books containing Cuts of all Iron now made, and Sample Pieces at office. Please address 58 Hudson Street.

BORDEN & LOVELL,
Commission Merchants
70 & 71 West St.,
Wm. Borden, L. N. Lovell, — New York.
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Fall River Iron Co.'s Nails, Bands, Hoops & Rods,
AND
Borden Mining Company's Cumberland Coals.

T. B. CODDINGTON & CO.,
25 & 27 Cliff St., New York.
Bar Iron, Sheet Iron, &c
Of every description

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"IRON MERCHANTS,"
99 Market Slip, N. Y.
English and American Refined Iron,
COMMON IRON,
Band, Hoop and Scroll Iron,
Horse Shoe Iron & Horse Nails,
Norway Nail Rods and Shapes,
Cast, Spring, Toe Calk and Bessemer Tire Steel.
Sole Agents for the Celebrated Horse-Shoe Brand
HORSE RASPS.

WM. GARDNER,
575 Grand, 414 Madison & 309 Monroe Sts.
Bar, Hoop, Rod, Band and Horse Shoe Iron.
AGENT FOR
Best Norway N. R. & Shapes,
Spring, Toe Calk, Tire & Sleigh Shoe Steel.

A. B. Warner & Son,
IRON MERCHANTS,
28 & 29 West and 52 Washington Sts.
BOILER PLATE,
Boiler Tubes, Angle, Tee & Girder Iron, Boiler and Tank Rivets.
Sole Agents for the celebrated
"Eureka," Pennocks,
"Wawasset," Lukens,
Brands of Iron. Also all descriptions of Plate, Sheet, and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.

Geo. A. Boynton,
BROKER IN IRON
70 WALL ST, N.Y.

POWERVILLE
ROLLING MILL,
JOHN LEONARD,
450 & 451 West Street, NEW YORK.
Manufacturer of all sizes of MERCHANT IRON and HOOPS. Also Manufacturer of
Best Charcoal Scrap Blooms.
And Dealer in Old and New Iron.

Marshall Lefferts, Jr.,
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MANUFACTURER OF
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Galvanized Sheet Iron,
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MANUFACTURER OF
Best Bloom, Charcoal & Refined Sheet Iron.
Galvanized Telegraph and Fence Wire
Galvanized and Tinned Roofing and Slating Nails.
Galvanized Hoop Iron of all widths.
Galvanized Staples.
Corrugated Iron for Roofing, plain or gal'd.
Galvanized Bars and Chains for Cemetry Railing.
Tin Plates, Spelter, and other Metals.

SCRAP RODS.
3-16 Round and Square,
For sale at the following prices, subject to change without notice.

1 Ton lots	$117·50	per 2240 lbs.
2½ "	115·00	" "
5 "	112·50	" "
10 "	110·00	" "

Net cash currency, or 30 days' draft. Cartage, $1 per ton, delivery in Boston. Address
NAYLOR & CO.,
Proprietors of the
NORWAY IRON WORKS,
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S. WHITNUM,
Manufacturer and Galvanizer of
Coal Hods, Water Pails, Baking Pans, &c.
Galvanizer of Sheet Iron, Nails, Spikes and Tinned Roofing Nails, Wire, Hoop and Band Iron. Iron Work for Cemetery Purposes furnished complete.
Factory, cor Clay and Franklin Sts.,
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Iron.

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HAZARD & JONES,
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NEW & OLD RAILS,
FOREIGN AND DOMESTIC
Pig Iron,
Wrought & Cast Scrap Iron, &c.,
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SCOTCH AND AMERICAN
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PIG IRON,
Wrought and Cast Scrap Iron.
457 and 459 WATER STREET, And 235 SOUTH STREET, near Pike, NEW YORK.

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98 William Street, New York
Dealer in
Anthracite & Charcoal Pig Irons,
OLD SCRAP and CUT NAILS.
Gibbs' Patent Lock Nut and Washer, and Fish Plates for Rail Roads.

Birmingham Iron Foundry,
BIRMINGHAM, CONN.
ESTABLISHED 1836.
Rolling Mills complete for the manufacture of
Iron and Steel Rails,
Merchant Iron, Copper, Brass.
And the rolling all kinds of Steel.
Also, Shears, Trip Hammers, Presses, Rotary and Alligator Squeezers, Iron and Composition Castings every description.
India Rubber and Paper Callenders, Grinding and Cutting Machines, Gearing, Shafting, &c, most approved patterns.

BOONTON
CUT NAILS,
HOT PRESSED NUTS,
Machine Forged Bolts,
Washers.
Fuller, Lord & Co.,
BOONTON IRON WORKS,
139 Greenwich Street, New York.

Swedish Iron.
A Variety of Brands, including
UB HP N&B 03
BARS suitable for Steel of all grades, Wire, Shovels, Hoes, Scythes, Carriage Bolts, Nail Rods, Tacks, &c.
CHARCOAL PIG IRON for Bessemer and Car Wheels.
MUCK BARS for Steel Smelting and Re-rolling.
SCRAP or BAR ENDS.
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ABBOTT & HOWARD, Boston, Mass. AGENTS: ALBERT POTTS, Philadelphia, Pa.

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90 & 92 Mangin Street, 178 Pearl Street, 30 The Albany, Liverpool, England. } New York.

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Manufacturers of
PATENT CORRUGATED FIRE-PROOF SHUTTERS, of Superior Quality.
The best shutters known for protection against fire.
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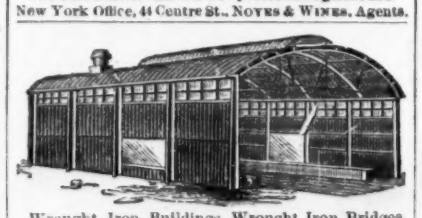
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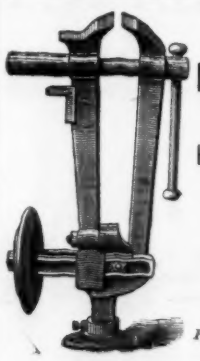
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[*Continued from page 1.*]

the reversing handle by which the engine driving the furnace is controlled, while above it are a hand wheel and screw for adjusting the supply of coal, a handle for opening or closing the throttle valve by which the blast is regulated, and another handle which operates a clutch and which enables the coal feeding apparatus to be stopped entirely when occasion requires it. The whole air and fuel supply is thus under the immediate control of the man in charge of the furnace; and the action can be regulated as readily as we can turn on or off an ordinary gas flame.

The furnace is lined with oxide of iron or in any other convenient manner, and owing to the protective action of the water casing the lining is found to give no trouble. The chamber of the furnace is pentagonal in cross section, and in practice it is usual to repair one side of the pentagon after each charge, the five sides being treated in rotation, and the whole lining being thus dealt with in the course of five charges. The manner in which the repairs are executed is very simple. When a charge is drawn a portion of the fluid cinder is left in the furnace, and into this are thrown lumps of cold fettling which embed themselves in the cinder and which are raked down level. On the top of these lumps the new metal is immediately charged, the whole operations of drawing one charge, repairing the lining, and recharging being accomplished regularly in eight minutes, while it has often been done in six minutes. The fettling generally used consists of lumps of ball furnace tap cinder, but puddle cinder and other fettling materials have also been used successfully.

We now come to the mode of working the furnace, which is characterized by great simplicity. Supposing the furnace to be cold, the flue piece is removed and a quantity of wood is placed in the chamber and a light applied. The flue piece is then swung back into its place and air alone is blown in until the wood is in a state of energetic combustion. The injection of the powdered fuel is then commenced and continued for about 40 or 45 minutes, by which time the furnace is white hot and ready for receiving a charge of metal. The fuel used in this preliminary heating is about 4 cwt., and the rapidity with which the furnace can be got ready for puddling is one of the most striking features connected with the arrangement. Of the fuel blown in during this preliminary heating we may add, there is none remaining unconsumed, the combustion being perfect.

The furnace being heated, a charge of 8 cwt. to 10 cwt. of cold iron is placed in it, and the air and fuel again injected for about three quarters of an hour, the time of course varying slightly according to the weight of the charge. As soon as the iron is melted the furnace is caused to revolve slowly, and the puddling process is continued until a ball is formed, when it is withdrawn and dealt with in the usual way. The lining is then repaired in the manner we have already explained, the furnace recharged and the cycle of operations repeated.

And here we may remark that Mr. Crampton's experiments have shown clearly that in dealing with large puddled balls the squeezer by no means forms an efficient substitute for the hammer. Some very powerful squeezers have been tried, but none of them are capable of freeing the blooms thoroughly of the cinder, a result not to be wondered at when the mode of action of a squeezer is considered. The proper way to treat puddled balls is undoubtedly to hammer them, and it is only by hammering—and well hammering—that heavy puddled blooms can be properly cleared of their impurities.

The results obtained with Mr. Crampton's furnace at Woolwich have been most satisfactory, both as regards quality and economy of production. In the course of an eight days' trial, conducted in the presence of Mr. Briggs, of the Carlton Iron Works, and Kirk, the average quantity of metal charged was 6 cwt. 3 qrs., and the average time occupied per charge (including fettling) was 1 hour 31 minutes only. The mean increase in the charges when withdrawn was 14·5 per cent., and the quantity of fuel consumed was 11·5 cwt. per ton of iron. This consumption was, however, greater than that used when dealing with larger charges, the consumption per charge for the 8 cwt. and 10 cwt. charges being practically the same as that for a smaller quantity. We may add that nine heats with 9 cwt. charges have been dealt with in a day of 12 hours, while if the furnaces were supplied with melted iron instead of cold metal, twelve or fourteen heats per day could no doubt be obtained.

New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN MACHINES FOR ASSORTING NAILS.

Specification forming part of Letters Patent No. 152,821, dated July 7, 1874, issued to John D. Baird, of Manchester, Virginia:

This invention relates to devices for separating imperfect nails, spikes or tacks, slivers, dirt, &c., from the perfect nails, spikes or tacks in a nail, spike or tack machine; and it has for its object to accomplish this separation in a rapid and complete manner.

The nature of the invention consists in the combination, in a nail, tack or spike machine, of one or more inclined stationary plates or rollers, with one or more inclined revolving rollers, as will be hereinafter more fully set forth.

Figure 1 is a perspective view of invention, and Fig. 2 is a plan view of the same.

A represents the frame work of a nail or tack machine. B B' represents two rollers in cylindrical form, of metal or other suitable hard material, and of any required dimensions. These rollers are placed in an inclined position, as shown, and are made to revolve outward from the nails passing between them, which motion may be obtained from the spindle of the nail machine, or in any convenient manner. The roller, B', has its bearing at the lower end in a slotted box, C, which is held to the frame by a set screw, *x*, so that the opening, *a*, between them may be made larger or smaller, as required, to suit different sizes of nails, or tacks, or spikes. This apparatus is provided with a wing, D, on each side, to conduct the nails or tacks to the rollers.

This apparatus, properly put together, may be adjusted to the nail and tack machine under the point where the nail or tack leaves the dies. The nails or tacks, as they are cut, fall on or are guided to the opening, *a*, by the wings, D D, on each side. The inclination and revolving motion of the rollers carry the good nails to the lower end of the apparatus, where they drop, through circumferential grooves, *b*, in the rollers, into a keg or box, while the imperfect nails or tacks, slivers, dust, dirt, &c., fall through the opening, *a*, into a receptacle prepared for them.

The above simply refers to the employment of one pair of rollers, but any number of rollers may be used, they being arranged with openings between them; also, in place of pairs

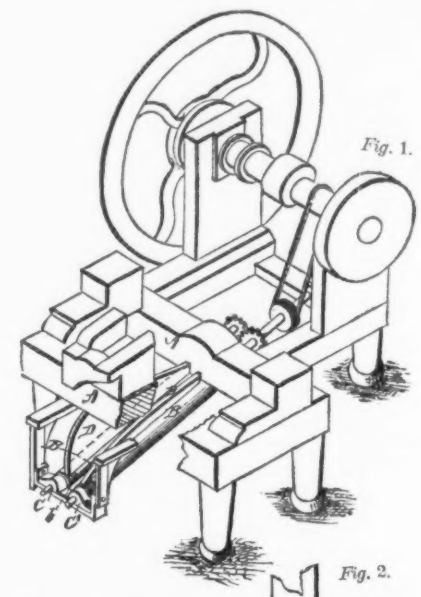

Fig. 1.

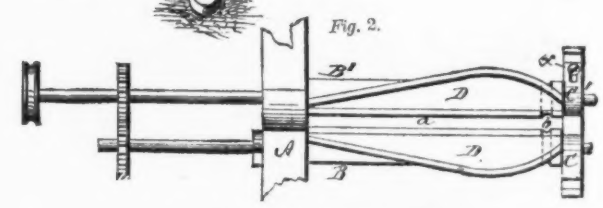

Fig. 2.

IMPROVED NAIL SORTING MACHINE.

of rollers, each roller may be used in combination with a guide plate, with openings between them, to be made adjustable in the same manner as above described.

Claim.—The combination, in a nail, tack or spike machine, of one or more inclined stationary plates or rollers, B, with one or more inclined revolving rollers, B', as and for the purposes set forth.

First Use of Illuminating Gas in America.

It is asserted that gas was first used for lighting buildings in Rhode Island. On the 13th of November, 1813, David Melville, of Newport, and Winslow Lewis, of Boston, announced that they had become the proprietors of a patent issued by the President of the United States, of an improved gas lamp for lighting manufactories, mills, mines, theatres, &c., with hydrogen gas or inflammable air produced from pit coal. The proprietors asserted that the new light was safer, more agreeable, and less expensive than any other, and that there was no danger from sparks or the use of snuffers, as was the case in the use of oil lamps and candles. Insurance rates would thus be lowered, and a great saving would be secured to the manufacturer who used the new gas light. Persons were referring to a building in Newport, R. I., in which the new system was in successful operation, and also the cotton manufactory belonging to Seth Bemis, at Watertown, Mass. They further stated that the patentee had just (November 13, 1813), placed the new system in the Wenscutt factory, one and a quarter miles from Mill Bridge, which mill was brilliantly illuminated every evening. Gentlemen interested in cotton mills were urged to visit these places, and inspect the new invention. The proprietors offered to furnish the necessary apparatus for any number of burners at ten days' notice.

The Arkwright mill, then principally owned by Mr. James De Wolf, was also lighted by gas under this patent. The works were erected under the superintendence of Mr. Melville. This, however, must have been subsequent to the Wenscutt works, since, had the works at Arkwright been in operation at the date of Mr. Melville's advertisement, he would undoubtedly have referred to that mill instead of Mr. Bemis', at Watertown, and the building at Newport; unless, indeed, the fatal accident which happened at Arkwright induced Mr. Melville to suppress the fact. In this view we do not concur. The story of the accident, gathered entirely from recollection, seems to be as follows: Mr. Abraham Churchill, employed in the capacity of watchman, saw what he thought to be a light moving about the mill about ten o'clock in the evening; he, therefore, took an old fashioned tin lantern, punched with holes, and containing a tallow candle, and with this he proceeded to examine the mill. He found nothing wrong about the mill, and went to the building adjoining, which contained the gasometer. Entering this building, he removed the candle from the lantern, and holding the flame to the mouth of a large stop-cock, turned on the gas. The flames were instantly drawn within the gasometer, which exploded, destroying the building and so injuring Mr. Churchill that he died the following morning. He was undoubtedly led to this act by seeing Mr. Melville perform a similar experiment. Mr. Melville had constructed a tube on the top of the gasometer, from which, on removing a plug, a jet of gas would escape. This jet he would light, thus throwing up a flame two or more feet high to the delectation of the spectators. But Mr. Melville was always careful to see sufficient pressure applied before ignition. This lack of pressure was probably fatal to Mr. Churchill.

Such are the facts so far as we can gather them. We have not discovered (although we have diligently searched) the date of Mr. Churchill's death, nor any reference to the accident in the public prints. The gasometer was never rebuilt at Arkwright, and we can readily conceive the effect of such an accident on the new enterprise. Reasoning from the facts, it seems to us unlikely that the first gas works in Rhode Island were erected at the Arkwright mill. In England gas was used in partially lighting a mill as early as 1798, and a mill at Bolton, England, was fully lighted in 1805. The London Gaslight Company soon followed in 1810. So that it is probable that Mr. Melville's process came from England, and with the collapse at Arkwright went out in Rhode Island for many years.

The Landore Tin Plate Works.

A correspondent thus describes a visit to the Landore Tin Plate Works, in Wales:

Here we had an opportunity of seeing the manufacture of tin plates from the puddled bloom to the finished article. The piles are first rolled to a plate eight times the thickness of the tin plate required, and the plate is folded eight times, reheated and rerolled, down to the same thickness as before. The compound plate or slab thus obtained, is sheared, and its laminæ are then separated by girls. The thin plates thus obtained are next annealed in closed boxes, pickled in dilute sulphuric acid, washed and planished by cold rolling. Next they are again annealed, pickled and washed, when they are passed on to the department where they receive their coating of tin. Here they are first placed in a bath of melted palm oil, then dipped into a tin bath, and subsequently into a bath containing a finer quality of tin, this bath having finely finished rollers immersed in it, between which the tin plate passes during its exit. These rollers remove all the superfluous tin which in the older tin plates used to be frequently noticeable. Having been coated with tin the plates are next dipped in sawdust and wiped, when they go off to the room where they are examined and sorted for packing. With the exception of the puddling, rolling, annealing and dipping, nearly the whole of the manufacturing processes are carried out by girls, and the manual dexterity displayed in many of the operations is surprising. As an example of what could be done in the way of plate rolling, the proprietors of the Landore Tin Plate Works lately presented to the Institution of Mechanical Engineers six samples of plates of the following dimensions and weights:

Size of Plate. in. in.	Weight. grains.	Weight per sq. foot. grains.
6¾ x4¾	6·522	30·9
9¾ x9	27·022	40·7
9 x5¾	12·716	35·2
8⅞ x5¾	22·880	70·7
45 x9¾	1389·297	46·2
41 x8¾	1130·808	55·8

These plates were rolled cold in the planishing rolls, and it will be seen from the weight that the thickness of the lightest must be but 0·00011 in., or 1-9090 of an inch. Even the large plate, 45 in. long, must be but 0·000165 in., or 1-6060 in. thick.

The works of the Atlantic Car Company at Salem, were sold at auction, recently, to Francis Dane, of Hamilton, for $35,650. The company's affairs are being closed up.

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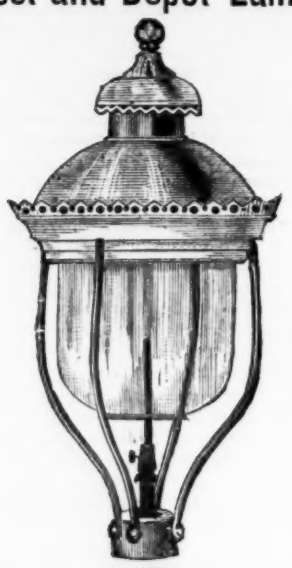

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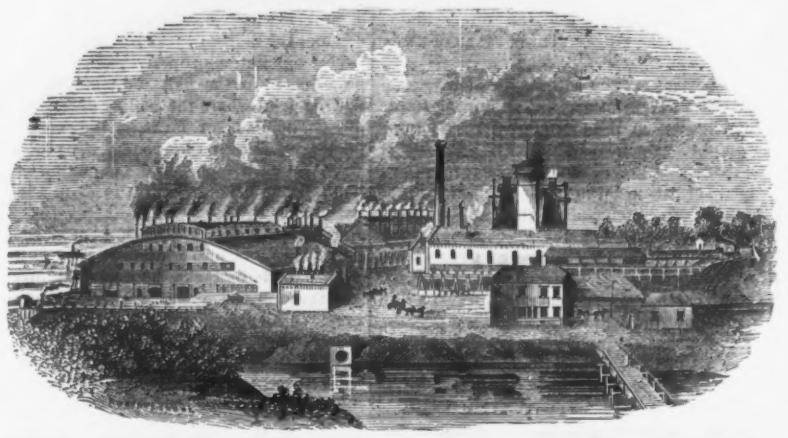

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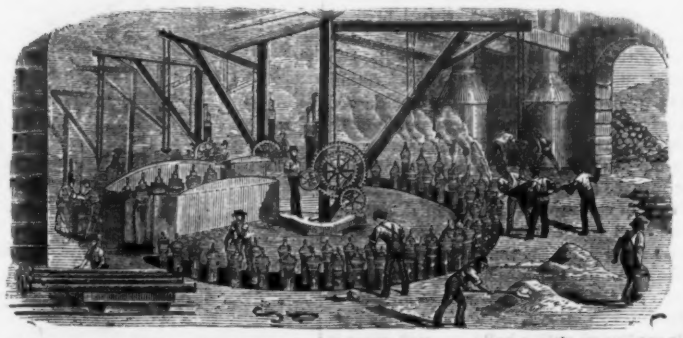

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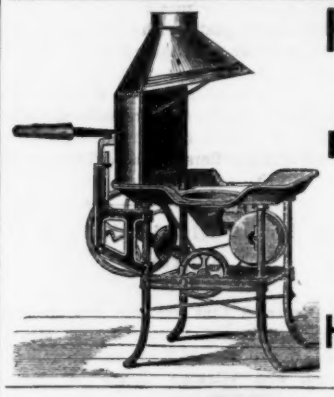

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EVERY CLASS OF WORK.

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This Strap, designated on our List as Letter "X," is of novel construction—is elastic, pleasantly yielding to the razor—gives a keen fine edge—is made of superior stock—is furnished at a low price—**and gives universal satisfaction.**

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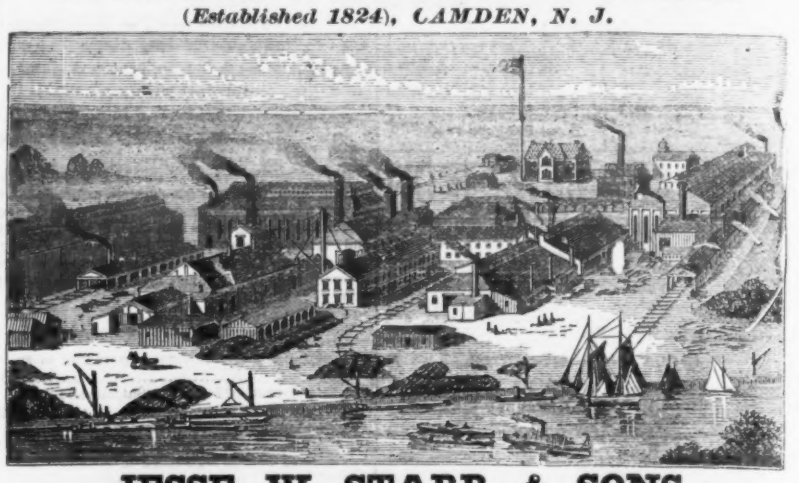

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Of uniform quality, unsurpassed for strength and wear, and of any required length. Address the Proprietors Pottsville, Pa.

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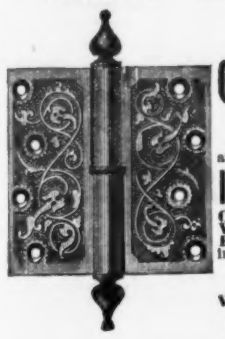

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IRON & BRASS PUMPS,

Cistern, Well, and Force Pumps, Yard, Drive Well, Garden Engine and Steam Boiler Pumps, Hydraulic Rams, etc., and all with the most modern improvements. **☞ Fine Castings a Specialty.**

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Over 800 different styles

Pumps, Steam Pumps, Rotary Pumps, Centrifugal Pumps, Piston Pumps,

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Will furnish with first Order above case, gratis, or Sample Room. Send for price list to the Trade.

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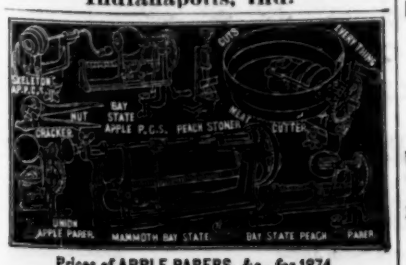

Prices of APPLE PARERS, &c., for 1874.

Bay State Apple Paring, Coring and Slicing Machines (does all at once)	₱ doz.	$15 00
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Union Improved Apple Parers	"	8 50
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Peach Stoner and Halver	"	7 00
Meat Cutters	₱ doz.	$20 00 and $25 00

"Skeleton" and "Union" in 50 doz. lots, ₱ doz. $8 00. Other kinds included at 1 per cent. discount from list. Terms, 30 days, or 5 per cent. discount if sight draft be made on shipment.

Manufactured by

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Double Acting,

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ALWAYS RELIABLE

VALLEY MACHINE CO., Easthampton, Mass.

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CUCUMBER WOOD PUMPS.

BARGE AND TANNERS' PUMPS, HYDRANTS AND AQUEDUCT PIPE.

Factory, *CHARLESTON, West Virginia.*

Goods shipped from Factory via River to all points West and Southwest. Eastern and Southern Coast Trade shipped from New York Depot, with expenses only added to factory prices.

Price List with description sent on application.

See wholesale price current in this paper

How Mowing Machine Knives are Made.

The manufacture of the triangular piece of steel which constitutes the cutting portion of a mowing machine seems to be a very narrow specialty upon which to found a manufacturing establishment. Its preparation is, however, by no means as simple as it seems, and the magnitude of the business in mowing machine knives, as well as the complicated process of producing them, has given rise to several large manufactories of this character. The process of manufacture is very interesting, and we give it as carried on in the works of Messrs. Geo. Barnes & Co., Syracuse, N. Y. This company is the successor of Sweet, Barnes & Co., was incorporated in 1864 with a capital of $208,000, now employs over 200 men, whose monthly pay roll is $7850.

On entering the machine shop one meets with large piles of sheet steel waiting to be sheared up into strips of various widths, according to the size and shape of the section to be cut out. Wm. Jessup & Sons' best saw plate is used, and the manufacturers claim that they consume over 300 tons per annum. The sheets are generally 8 ft. long and 18 inches wide. After they have been sheared up into strips of the requisite width, the latter pass to the punch where, they are cut into sections of the proper shape. The die in the punching machine is of wrought iron, lined with steel, and will punch from ten to twelve thousand sections without being resharpened. The punch also not only cuts the sections but actually counts them, being provided with one of Fowler's patent registers, which is so nicely adapted to its purpose that while it records accurately every blade, it gives no record if the die simply descends without cutting a section. This machine will punch out

20,000 SECTIONS IN 10 HOURS,

and requires the attention of only one man. The lower half of the die, in which the sections are cut, is so made as to be adjustable to the thousandth of an inch. The necessity for such nicety of adjustment will appear from the fact that it takes from 14 to 30 of these sections to make a complete knife, and these must be riveted to a rod so as to touch one another and form a close joint and still not crowd each other.

The sections are cut from both sides of the strips of steel in such a manner that the only remnant is a zigzag strip of steel not over ⅛ inch in width. This is the only wastage that occurs in the punching, and is cut up into short lengths by a punch and shipped back to England as ballast. A third punch is used for cutting out the blanks, or the sections, which are usually riveted at the ends of the bar, and are generally of a different shape from the rest of the sections.

The sections generally leaves the punch somewhat bent out of shape, and the next operation is to straighten them. In a little room in which this operation is carried on is a reverberatory furnace with five openings, and the furnace is, therefore, divided into five portions, one of which is used as an annealing furnace, and is heated by the waste heat from the other four. The latter are used as heating furnaces, and in them the sections are raised to a low, red heat, after which they are passed in quick succession under a flat faced hammer which straightens them out and prepares them for the tempering room. Four straighteners can work here, one to each hearth. In

THE TEMPERING ROOM

are nine hardening furnaces. The process in this case has for its object the hardening of a strip along the edge of the section, without changing the hardness of the rest of the section. Over each hardening furnace is a small box containing melted lead. The section is taken by the operator in a pair of pliers, which are so shaped as to leave that portion of the section exposed which is to be tempered, and the piece is then immersed in the lead. That portion of the section which is covered by the pliers is thereby prevented from becoming very hot, while an exposed strip along the edge is raised to the temperature of the lead. The section is then dropped into a salt brine, and on touching the water produces a loud report. When the section is first taken up by the pliers it is placed upon the surface of the lead to dry, and afterward taken out and placed in a fork-shaped gauge from which it is removed by the pliers. This is done in order that the pliers may grasp the section in the same place every time. The operation is very interesting, and is carried on very rapidly, the workman tempering one section while another is drying on the surface of the lead. This firm claims to be the only one engaged in this business that uses salt brine in hardening. It is generally conceded that the hardening of sheet steel in this way is hazardous on account of the liability to loss by breakage. The appliances for registering the heat of the lead, however, are so carefully adjusted that the overheating of the steel is rare. Indeed, the men are paid by the hundred, and from their wages is deducted the price of every section they break.

After the hardening process the sections are tumbled in tumbling barrels to brighten their edges, so that when they are tempered one may easily determine the color of the steel. After the tumbling process the sections are sent to the inspector, who examines every one to see if it is properly hardened. All that are not perfect in this respect are rejected. The sections are now hard enough to scratch glass, and need to be toned down to give them an elastic edge when ground. In

THE TEMPERING PROCESS

two hot air furnaces are used, which are practically air tight. A small metal carriage having been carefully loaded with from four to five hundred sections is run into each oven. The temperature of this oven is maintained at such a point that in thirty minutes the buff, hardened portion of the section ha the desired color. One person loads the carriage, and another simply attends to the oven, and from time to time draws the carriage out and examines the color of the steel. Very skillful operatives are employed in this part of the manufacture. The guard plates of the knife are made of malleable iron, with steel plates hardened on the edges in the same manner as the sections are hardened. Other portions of the machine must be hardened and tempered as well as punches, chisels, etc., which are made to go with the machine. The hole which is made in the heel of the knife bar to receive the pivot, by which it is connected with the pitman, has a steel lining formed by welding in a hole in the pitman head a steel plug, which is afterward bored out so as to leave a case or rim of steel, which is then annealed and afterward hardened.

THE GRINDING ROOM,

however, is the most striking portion of the works. Here the sections are first ground to an edge by placing them in a carriage which carries them against the surface of the stone. Each man grinds from 1500 to 2200 sections, on two edges, in a day, and is paid by the hundred. Before they are sent to the grinding room, however, they are examined by inspector No. 2, and, when the grinding is completed, they are returned to the same inspector, who rejects imperfect pieces, and charges the workman with all that are missing. The sections are then faced on both sides on stones used for this special purpose, and as they come from the stones bright and clean, the color of the steel, where it has been tempered, shows very plainly. The sections are next immersed in a hot lime water bath, and thence taken to a steam radiator, upon which they are dried, a thin coating of lime remaining upon them, which prevents them from rusting. Then they are carried on the elevator up to the finishing room, and pass into the hands of inspector No. 3, who receives them in hand trays, each labeled with three tags indicating who tempered, ground and faced them, and here the final account with the men is balanced.

The grinding room is 160 feet long by 40 feet in width. About 30 grindstones are kept constantly running, and most of them are 6 feet in diameter. The stones are worn down by grinding on their faces to 2½ feet diameter, and are then ground upon their sides until their thickness is reduced to two inches.

The stones are arranged in two tiers, and run by two lines of shafting. Eleven stones are used for grinding edges, ten are employed in facing the sections, and eight are used in grinding the knife bars after the sections have been riveted on, to remove rough edges of rivets, burs, etc. Two stones are run together in grinding rods. Their shafts form an obtuse angle with each other, a little less than 180°. This causes the faces of the stones to incline toward each other. The stones are adjustable by set screws so as to be moved toward or from each other. The stones are arranged in this manner because the rods which are inserted between them to be ground must clear the faces of the stones in the rear, otherwise the end of the rod would be thrown up by the upwardly revolving portion of the faces. The grit from the grindstones accumulates so rapidly that it is removed from the trenches at the rate of two tons per day. The air in the grinding room is apt to be continually filled with flying particles of dust and with moisture, and the effect on the health of the men is very serious. The firm has, however, caused

A HUGE EXHAUST BLOWER

to be erected, which removes all the air from the grinding room once every five minutes, so that no unpleasant effects are now experienced from the peculiar nature of the atmosphere. Ten thousand cubic feet of fresh air are drawn into the room every minute. The blower is 8 feet 3 inches high and weighs 2 tons. Ten horse-power is required to drive it. The air, having been withdrawn from the room, is driven into the fires beneath the boilers, and in this way the firm are enabled to burn the refuse dust of coal yards, and therefore obtain their fuel at a low rate. This firm claims to have given the largest single order for grindstones ever given in the world. This was an order on the Ohio quarries for 1000 tons of grindstones. At the door of the grinding room is a heavy derrick for delivering the stones into the works.

Outside of the grinding room is a small building containing

THE PUMP,

which supplies water to the grindstones. The roof of the building is a large tank capable of holding 55,000 gallons of water, a supply which, if not renewed, would last three days. The stones, therefore, require about 18,000 gallons of water per day. The pump supplies this quantity to the tank daily. The tank is 18 ft. high and 24 ft. in diameter, and, when full of water, weighs 225 tons. The water is conveyed to the tank a distance of 600 ft., and the total lift is 18 feet. The exhaust steam from the pump is conducted into a radiator, and the pumping building is, therefore, constantly kept warm to prevent freezing. A float is connected with an indicator on the exterior of the tank which shows the hight of the water within.

After the sections leave inspector No. 3 they are sent to the polishers, and thence to the countersinking apparatus. The operation of countersinking is accomplished with great rapidity, the workman handling sections with both hands and bringing the tool to its work with his feet. The sections are next covered with a coating of tallow, and are either put upon the shelves or riveted on knife backs or packed into paper boxes and tabled ready for shipment. All sections, whether put upon bars or packed in boxes, are stamped with the company's trade mark.

When the sections are riveted to the knife bars the greatest care is used. There is no necessity for the fitting or enlarging of holes, as each rivet hole and section is made with great accuracy. The rod may be laid upon an iron surface and the sections laid upon the rod without their crowding each other or crowding a single rivet out of the perpendicular. This result is accomplished by having all the rivets made at one place and of an uniform gauge, and preparing the drills and punches with equal care. The latter are made from Stubbs' steel wire. When the section is laid upon the rod the holes match each other exactly, and the rivet is thereby held upright, and the full force of the blow is transmitted throughout its entire length. In these works from 500 to 700 complete knives and sickles are put together in one day. The knife bar is made of cold, rolled iron, and the heel and head are of Norway iron, hardened.

The works are heated by

DIRECT RADIATION

from steam heaters. The water which condenses in these radiators flows down into and through pipes under the floor into one pipe in the yard, and by means of a Berryman trap is conveyed to a large cylindrical cistern 40 ft. in diameter in the clear and 6 ft. deep. It is then pumped into the boilers and used in the production of steam. As this water is quite hot when it enters the boiler there is here a great saving of fuel. The exhaust steam from the engine is also taken through a Berryman heater and conductor combined, and the water which is thus condensed amounts to over 300 gallons per hour. It is conveyed by the conductor to the cistern to be pumped therefrom by a Wright's bucket plunger steam pump. The conductor and radiators together furnish about 30 per cent. of the water used in the boilers, and as it is distilled water, it is of great value in dissolving the boiler crust deposited by the hard water in which the country abounds. The latter difficulty is also provided against by a surface blow-off provided for each boiler, which is used at night when the fires are shut down, and a bottom blow-off used in the morning before the fires are started again.

THE ENGINE

is of the Corliss type, and has a 42 inch stroke and 18 inch bore. Its fly-wheel is 15 feet in diameter, and has a 24 inch face. It is nominally of 100 horse-power. A smaller engine is also used for the forge. Steam is generated in a battery of four boilers, each 15 feet long and 54 inches in diameter, with 71 three inch tubes. The boilers are each hung from an overhead truss, and are so set that not a brick touches them. Their tops are felted.

THE MACHINE SHOP

is amply furnished. Specially among its apparatus are found machines for cutting twist drills, geared drills for drilling the eyes in the knives, milling machines for dressing irregular shapes, such as the head or heel of the knife; several engine lathes for making and repairing tools, crank planers, a Philadelphia shaping machine, an index gear cutting machine and bolt cutter, large planers and an upright power drill. Most worthy of notice, however, is a full set of Whitworth gauges of standard sizes.

The forge room is also elaborately furnished. Here are two of Bradley's hammers, a Shaw & Justice hammer, a punch and shearer for 1¾ inch iron, carbonizing furnaces, and 15 forges.

The officers of the company at present are: President, Joel Thayer, of Skaneateles, N. Y.; treasurer and manager, George Barnes, of Syracuse; secretary and book-keeper, Wm. W. Cox; superintendent of the works, Royal H. Thom.

Ancient Bills of Lading.—Some papers of Sir William Pepperill, who, in ante-revolutionary times, resided at Kittery, Maine, have recently come into possession of a resident of Newburyport, and the *Herald* of that place copies a bill of lading dated June, 1726: "Shipped by the grace of God in good order and well condition, by Wm pepperills on their own acct. and risque, in and upon the good Briga, called the William, whereof is master under God for this present voyage George King, and now riding at anchor in the river Piscataqua and by God's grace bound to Barbadoes," and then follows the freight, lumber, shingles, oak staves, timber, fish, yokes and bows, winding up, "and so God send the good Briga to her desired port in safety. Amen." Accompanying this bill of lading is a letter of orders to Capt. King as to how he is to proceed and to deliver the freight to Thomas Harper, esq, merchant of Barbadoes. The spelling is rather uncertain: in the indenture it is "marchant," and in the letter "merchant." There is also another letter to Capt. Foxall Curtice, dated Aug. 13th, 1717, master of the brig William and Jane, going to Newfoundland, where he is to buy French brandy and claret wine. The captain is to be secret about it, although there was no prohibitory liquor law at that time.

Lehigh Valley Notes.—The Allentown *Chronicle* speaks discouragingly of the prospects of the iron trade, and says "There is no use disguising the fact that the iron business in the Lehigh Valley is destined to be very dull during the next year. The furnaces are piling up iron which they cannot sell at a profitable figure, and notwithstanding the brief stiffening in the market that occurred a few weeks ago, the price has gone back to the old figures. A gentleman largely interested in the trade, not long ago made a tour through the valley, visiting the several furnaces, and at that time he came to the conclusion that iron was at its bottom figure and must rise speedily. He purchased from several furnaces, and now he is selling what he then bought at a dollar less per ton than what he gave for it. It is inevitable that those dependent on the iron business for a living will experience very hard times. Some of the men working at the ore mines are receiving but eighty cents a day for their labor, and how they and their families manage to get along on that sum is one of the wonders. Some sales of iron will probably be made in September and October, but they will not be of very great account, and trade will fall to its present state. The Allentown iron company have stored 15,000 tons of pig iron, the Lehigh Valley 3000, the Lehigh 6500, and the Roberts from 6000 to 8000."

THE NICHOLSON FILE.

All Nicholson Files are cut with the Patent *Increment Cut*, an invention owned and controled exclusively by us, the file cut in this manner being Patented as a new article of manufacture, and differs from all other machine cut files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly *expanding or increasing in size and space from the point*, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at least) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will *not* be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformityof machine work. It is now upwards of seven years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

We put all files under seven inches in boxes of either one-half or one dozen each. These boxes are neatly arranged, and open on the end, on which the kind is plainly marked with printed labels, acknowledged improvements on the old methods.

The "*Increment File*" is not an experiment, but an established fact, and already has acquired a legitimate demand for upwards of 500 dozen per day. We employ no *regular Travelers*, but our goods may now be found in the hands of the principal jobbers and dealers throughout the country.

Prices and terms will be forwarded on application to

NICHOLSON FILE COMPANY,
Providence, R. I.

USE THE BEST.

AMERICAN FILE COMPANY

Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

Established 1816.

Peter A. Frasse & Co.,

95 Fulton Street, New York,

SOLE AGENTS FOR

Thomas Turner & Co.'s Suffolk Works,
SHEFFIELD.

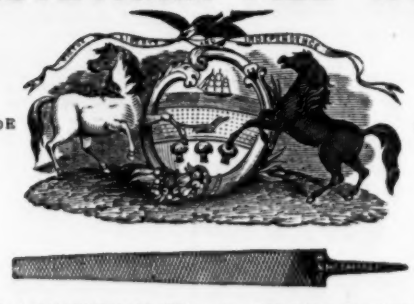
FILES AND HORSE RASPS,

And Importers of

P. S. **STUBS' FILES, TOOLS & STEEL,**

W. J. Davies' Sons' London Emery Cloth,
HUBERT'S FRENCH EMERY PAPER.

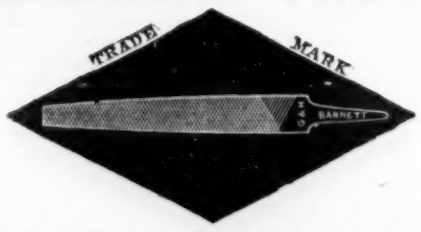
PENNSYLVANIA FILE WORKS.

TRADE  MARK

McCAFFREY & BROTHER,
Manufacturers of FIRST QUALITY FILES and RASPS ONLY,
Nos. 1732 & 1734 North Fourth Street, Philadelphia, Pa.

Black Diamond File Works.

Send for Illustrated Price List.



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LINFORTH, KELLOGG & CO.,
Sole Agents for the Pacific Coast, 3 & 5 Front St., San Francisco, Cal.

Leather Belting.

PAGE BELTING COMPANY.
Sole Manufacturers of
TRADE MARK.
Page's  Patent Tanned Belting.

CENERAL MILL SUPPLIES.
No. 24 Exchange Street, Boston.

BRADFORD & SHARP,
Manufacturers of
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OAK TANNED,
57 Walnut Street, Cincinnati, O.
We furnish many of the largest Iron Mills in the West, and guarantee quality of all goods sold.
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Alexander Brothers,
Manufacturers of **OAK TANNED**
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410 & 412 North 3d. Philadelphia, Pa.

THE
Wethersfield Novelty Co.,
Manufacturers of
Builders' Hardware
AND
PLATED GOODS,
Wethersfield, Ct.
Brass and Iron Founding. Light Castings for outside parties a specialty.
Gold, Silver, Nickel and Bronze Plating. Orders solicited.
Communication from Hartford by Horse or Steam Cars.

RIEHLE BROTHERS,
Ninth Street, near Coates, Philadelphia.
New York Store, 93 Liberty Street.
Pittsburgh Store, 285 Liberty Street,

"Patented" Furnace Charging Scale.
Double Beam R. R. Track Scale, Compound Parallel Crane Beams, &c. Patented First Power Lever Wagon Scales. Testing Machines any capacity.

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THE EAGLE SQUARE CO.'S Steel and Iron Squares.
E. F. HURD'S AXES, HATCHETS, ADZES, &c., &c.
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SCOVIL MFG. CO.'S BRASS BUTTS.
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Celebrated Hand-Cut FILES,

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EVERY FILE WARRANTED.

Western Files. Western Files.

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LARGEST CAPACITY
Of any File Works in the World.

In the face of strong prejudice against American files, this brand has earned a reputation second to none. The trade in all sections testify to their excellence. We confidently offer these files as superior in every respect and cheaper than any first-class file in the market. A trial will confirm their reputation.

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MADE FROM THE BEST
IMPORTED STEEL
BY THE
Auburn File Works,
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Axe, Pick, Sledge & Hammer Handles.	Scale Beams.	Axes, Picks and Hatchets.
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Gimlets and Gimlet Bits.	Climax Horse Collars.	Boring Machines.
Augers and Auger Bits.	Brundage Horse Nails.	Cast Iron Hatchets.
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Butchers' Cleavers. Corn Knives. Bush Hooks. Coopers' Tools. Ship Adzes and Axes. Drawing Knives. Axes and Hatchets. Grub Hoes. Picks and Mattocks. Mill Picks. Box Chisels & Scrapers.

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MECHANICS' AND MACHINIST TOOLS,
COOPERS' TOOLS & TRUSS HOOPS a specialty.

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Solid Cast Steel Pump Auger.

Agent for Merchant's Improved **Dowelling Machines.**

Any one in the trade not receiving my new Price List will please inform me.

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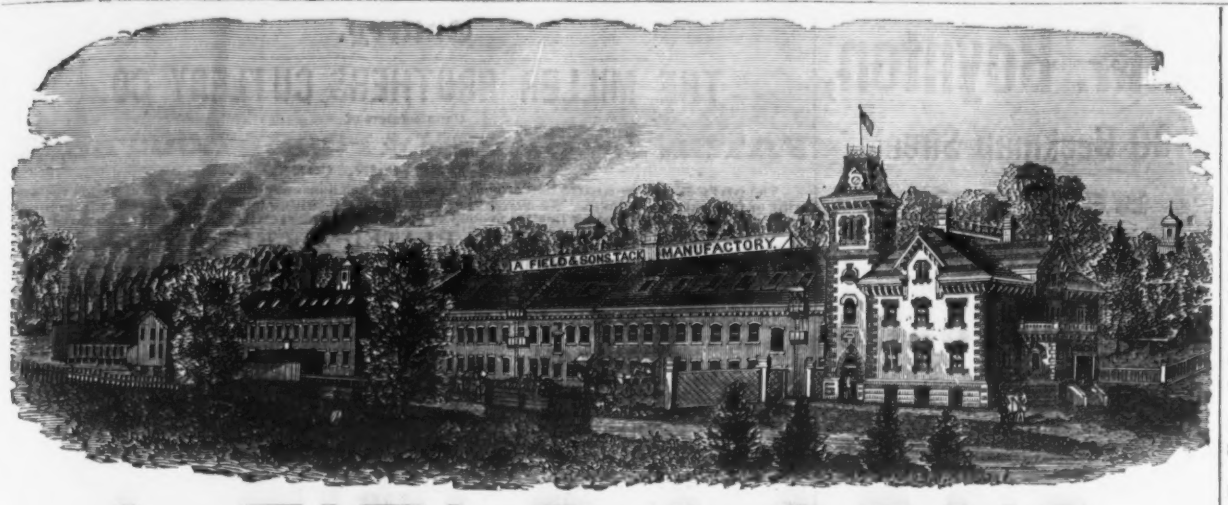

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Copper and Iron Tacks, Tinned Tacks,

SUPERIOR SWEDES IRON TACKS. for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

American and Swedes Iron Shoe Nails,

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Annealed Trunk and Clout Nails, Hob and Hungarian Nails,

Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails
Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks,
Glaziers' Points, etc., etc.

OFFICES AND FACTORIES AT TAUNTON, MASS.

WAREHOUSE AT 35 CHAMBERS STREET, NEW YORK, where may be found a full assortment of Tacks, Brads, &c. for the accommodation of the New York Wholesale and Jobbing Trade.

☞ Any variations from the regular size or shape of the above named goods made from samples, to order. ☜

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28 Wilson Street, Finsbury, London, Eng.

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To AMERICAN MANUFACTURERS we offer our services for the introduction, in Great Britain and the Continent, of MACHINERY and TOOLS of improved construction. It is now seven years since we established ourselves in London, and during that time we have succeeded in establishing a demand which is now rapidly increasing, thus proving the value of these goods throughout Great Britain and the Continent. We are now the European Agents for several leading American Tool Makers, to whom we will give reference on application to either our London or New York house.

We invite all makers of Improved Machinery and Tools to communicate with us, sending us catalogues and price lists. We shall be pleased to take up and introduce all such goods suitable to this market. Having successfully introduced American Vises, Chucks, Drills, Drilling Machines, Pumps, and a variety of other tools and household utensils, we are confident all good and useful articles will meet with success.

We are European Agents for *The Iron Age*, to whom reference may be made.

AMERICAN MANUFACTURERS receiving orders from abroad can communicate with our New York house and execute the orders through us, thus avoiding all risks. C. CHURCHILL & Co. also offer their services to all purchasers of Machinery and Tools in Great Britain and Europe who may require special goods, for which quotations will be given on application. A Stock of Tools and Machinery are kept in our London Warehouse for immediate delivery.

Catalogues and Price Lists sent post free on application.

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Prices Reduced!!!
OHIO TOOL CO.,
Planes and Plane Irons.
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Patented,
June 3, 1862; April 6, 1869; Dec 23, 1873; Jan. 20, 1874.
Manufacturer of

JAPANNED and PATENT EUREKA
Bright Metal
BIRD CAGES.
Nos. 247 & 249 Pearl Street
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American Chain Cable Works.
Thirty years' experience in the business.

KENDRICK & RUNKLE, Trenton, N. J.,
Manufacturers of Cable, Crane, Car Brake, Agricultural Machine and Harness Chains of every description. Also, sole manufacturers of
KENDRICK'S PATENT IMPROVED TRIPLE COAL MINE SLOPE CHAIN.
N. B. The highest grades of Crane Chains a specialty.

New England Chain Works
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Manufacture **Iron Chain** of every description.
Mowing Machine, Crane, Break, Draft Chains, &c., &c.
Also, Latest Improved Cotton Can Rings.
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Celebrated Silver Plated Goods,

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Price Lists and Discounts mailed on receipt of business card or reference. Address

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MANUFACTURERS OF

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Of all descriptions.

STEAM HAMMERS a specialty.

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Wrought Iron Carriage & Wagon Hardware

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Manufacturers of

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SHOVELS, SPADES & SCOOPS

Of all Descriptions,

Without straps or rivets, of the best English and American Cast Steel. Every Shovel warranted. Printed lists of prices and discounts to be had on application at the office.

SOLE AGENT,

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BUSINESS ITEMS.

PENNSYLVANIA.

The rolling mill at Fullerton, below Catasauqua, which has been idle for some weeks, started work a few days since.

Ferndale Rolling Mill has commenced work, and the prospects for steady work are encouraging.

The Minersville Coal and Iron Company, of Schuylkill county, have sold and shipped within the past two weeks 1600 tons of pig iron. The company are now considering the propriety of building another stack.

After a stoppage since the 1st of August, the Pittsburgh Forge and Iron Company have now their usual annual repairs completed, and are now working full single turn.

The works of the National Iron Company, at Danville, have been purchased by the Hancock Steel and Iron Company.

The Sharon *Herald* says: Spearman Furnace is making about 1000 tons of metal per month, most of it No. 1 and 2 foundry. The furnace has been in blast since last January.

The Harrisburg Foundry and Machine Shops recently tested the operation of making coal from anthracite dust, under a process and by aid of a machine recently invented. The experiment proved that what is usually considered waste can be utilized, and the coal dust turned into fuel.

The Pacific Mail Steamship Company have contracted with Mr. John Roach, of Chester, for three more ships 50 feet longer than the others.

The Lehigh Valley Iron Company have sunk four shafts on the Lehigh Mountain, at Zionsville, each of which is 300 feet long, and ends at a depth of 100 feet below the surface, in a magnetic vein of ore 14 feet thick. The ore taken from these mines amounts to about 800 tons per month, and is considered the best ore in Pennsylvania.

The Pottstown Iron Company shipped a day or two ago 400 kegs of nails to Yokohama, Japan.

One thousand one hundred and fifty tons of steel rails were recently shipped from the Pennsylvania Steel Works, at Baldwinville.

There is a strong probability that the Glenn Rolling Mill, Allentown, which has been idle for several months, will resume operations at an early day.

MASSACHUSETTS.

There is now some prospect that work on the monster Hitchcock cannon at the water shops, Springfield, will be begun before many months. Much labor has been expended on the hammer, which did not, when first hung, work satisfactorily, but which is now pronounced all right. The lathe for turning the gun has arrived from the manufacturers at Pittsburgh, and is now being put in position. Work on the gun has now been delayed fully a year longer than was anticipated.

The Southworth Manufacturing Company, of Mittineague, are to enlarge and thoroughly remodel their paper mill, and to add new machinery, &c. Six new rag engines are to take the place of the old patterns now in use, while a large, new water wheel, of the Boyden pattern, has been contracted for at the Ames Works at Chicopee. Tower Bros., of Holyoke, are preparing the plans, and the changes will require about three months.

The Lamb Knitting Machine Company, at Turner's Falls, have received a windfall in shape of a $5000 order from Germany. 150 machines will be required, and the mill will be run night and day to fill the order.

The Stevens Pistol Company, of Chicopee Falls, is now adding new and valuable machinery to its already large equipments.

WEST VIRGINIA.

It is said that the Swift Iron Works will actually be moved from Newport, Ky., to Charleston. The citizens of Charleston have raised a bonus of $50,000 and made some advantageous arrangements with regard to municipal taxation.

The Mingo Iron Furnace, at Wheeling, made 42 tons per day for several days in succession, a short time ago, which is the largest run that it has made.

KENTUCKY.

The contract for the iron work for Cincinnati's inclined railway has been awarded to Ainslie & Cochran, Louisville, whose foundry is at present actually engaged in filling it.

TENNESSEE.

At Kingston a foundry and machine shop have recently been established, and preliminary steps are also being taken toward the erection of an iron furnace, with every prospect of success.

CALIFORNIA.

The Kimball Manufacturing Co., of San Francisco, are building the rolling stock for the Saucelito (narrow gauge) Railroad.

The Union Iron Works, of Sacramento, employ at present forty men, and are engaged on the iron work for the Court House for Fresno and Tulare counties, which will require sixty tons of iron. They are also turning out the iron for the Sacramento Smelting Company. A great quantity of general jobbing is being done. The buildings belonging to these works are very extensive and cover several acres of ground.

OHIO.

The Brier Hill Iron and Coal Co. have blown in their number two stack. The object in starting the furnace at this time is to work up a large stock of ore and other raw material on hand. This stack has a good record, and will, no doubt, continue to do good work.

The new blast furnace at Newark is expected to "blow in" about November 1st.

The Licking Iron Company is building a new blast furnace adjacent to their works, which is expected to be finished in about two months. The stack will be about 41 feet high, and the boshes 11 feet 6 inches wide. The company intend to use one-fourth Lake Superior ore and three-fourths Perry county ore, and the Hocking Valley coal for fuel. A. M. Bratt, formerly of William Ward & Co., Niles, is the efficient superintendent of the concern. The capital stock of the company is $200,000.

The Pine Grove Furnace, at Hanging Rock, is 36 feet high and 11½ feet boshes. Its average daily product is 18 tons.

The furnace of Wm. Ricards & Sons, at Warren, has just been blown out for repairs. It will be relighted as soon as it can be put in order.

The Newark Iron Co.'s rolling mill has been shut down since last Christmas.

The Lawrence Iron Works Company, Ironton, having put their works in thorough repair this summer, are in full operation, and turning out the usual amount of the various classes of iron manufactured by them.

MARYLAND.

The Baltimore Copper Works (Pope, Cole & Co.), have now running 18 furnaces and 2 refineries, beside blast furnaces and sulphuric acid works connecting with the copper smelting. They can turn out 5,000,000 of ingots of lake copper per year, but at present make only 300,000 lbs. per month.

The Sheridan Furnaces at Lebanon, Pa.

The proprietors of these furnaces, Messrs. Wm. M. Kauffman & Co., have shown their business qualifications in taking advantage of the present depressed state of trade, and will have the honor of having one of the best, cheapest and most quickly constructed furnaces in the country. We say one of the best, because our townsmen, Messrs. Weimer & Birkinbine, are the engineers from whose plans the furnace is being built, and than whom none more competent can be found. We say one of the cheapest, because the work is undertaken with labor and material at unusually low prices, and because while nothing is spared to make the furnace a No. 1 in all respects. Economy has been carefully studied and nothing wasted. We say one of the most quickly constructed because the Messrs. Kauffman have allowed no grass to grow under their feet, but have pushed the work ahead in the most surprising manner, but with all proper regard to its efficiency. Work was only commenced on the ground in April, and although considerable grading had to be done, the entire furnace shows signs of rapidly approaching completion. The present appearance of the work may be briefly described as follows: The immense stack, 60 feet high and 16 feet bosh, is now being finished and the top plates and fence put up. As soon as the scaffolding is removed, the walls of the casting house, now partly constructed, will be completed and put under roof. The hot blast foundations are finished, and one set of 40 double pipes (Thomas' Patent) are in place, and the other set will be in place in about 10 days. The boilers are in position, and the other boiler work will soon be completed. The engine house is ready for the machinery, and the Messrs. Weimer & Birkinbine have already shipped from their works six car loads, or about one-half of the immense seven foot blowing engine. The pump house is about ready, also, and the pumping machinery, at the Weimer Machine Works, is almost finished. Unless one goes on the ground he is slow to believe what a large amount of work has been accomplished in so short a time. Add to the above the construction of about a mile of railroad track, and the quarrying of stone, making of brick, etc., and our readers can judge that this is not done *a la* government.

All the machinery and iron work except the boilers has been constructed in this town by Messrs. Weimer & Birkinbine. The boiler work is done at Reading by Messrs. F. J. Obert and Reazor & McCoy.—*Lebanon News.*

Coal mining in Nova Scotia is much depressed. The Canadian demand is very limited. The reduced price of coal in England threatens to check trade with the St. Lawrence; and doubts as to the Reciprocity Treaty, coupled with strong competition from the operators of bituminous mines in the United States, have almost brought freight shipments to a standstill. At the last dates from Halifax contracts were being freely offered at much reduced rates, merely for the purpose of keeping the mines going. When the great obstacles arising from want of labor and want of capital have been overcome, then a market has to be found for the coal raised. This is, perhaps, the greatest difficulty of all. From the comparative absence of wealthy capitalists, colonial society presents even less stability than is to be met with in English commercial life. Hence, the demand for colonial coal, like that raised in Nova Scotian mines, may be fairly good one year and may almost collapse the next. It is at some such collapse as this that the Nova Scotians seem unfortunately to have now arrived. The special dullness of the moment may, perhaps, have been over-estimated; but whether it has been over-estimated or not, it is not at all calculated to encourage an application of additional capital and additional labor to the utilization of the undoubtedly vast coal resources of Nova Scotia.

The Inter-State Industrial Exposition, of Chicago, opens to-day and will remain open until Oct. 10. The original mammoth building has been enlarged by the addition, on the south, of an elegant conservatory, built of brick, iron and glass, with rock work, waterfalls and fountains, and on the north by the addition of space for the exhibition of agricultural implements and machinery, both additions being part of the main hall, on the same floor level, and the whole forming by far the most spacious, costly and suitable industrial palace on this continent. Its entire continuous length is 1000 feet, with an average width of 240 feet. The departments, embracing machinery in operation, processes of manufacture, textile fabric, farm machinery and implements, works of art, plants and flowers, and, indeed, all others, will be crowded with novelties of unusual interest and attraction,

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS, TOOLS FOR BRAZING, &c.

Bed Screws, Pin Hinges, and Wire Nails a Specialty.

H. W. PEACE,

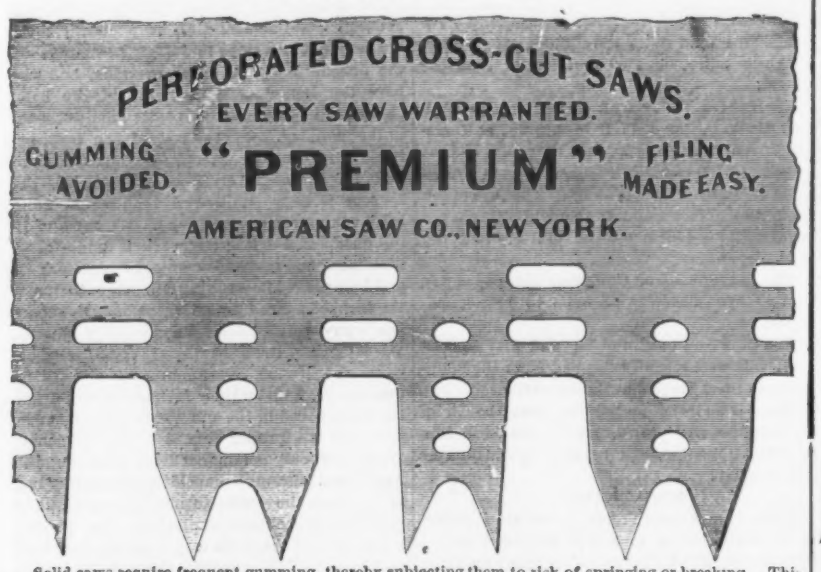
MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.,

TRENTON, NEW JERSEY.

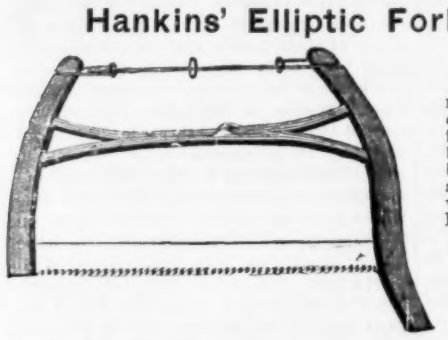


Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having *Patent Teeth*. In the perforated saws **all gumming is avoided** and the teeth are easily kept long and in *proper shape*, saving *files*, *labor*, *expense* and *vexation*. As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,

VULCAN SAW WORKS,

WILLIAMSBURGH, N. Y.

THE SILVER STEEL

DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.

Patent Secured

PATENT HANDLES AND GAUGE INCLUDED.

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by **E. C. ATKINS & CO., Indianapolis, Ind.**, who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

E. C. ATKINS. H. KNIPPENBERG. **E. C. ATKINS & CO.** Saw Manufacturers and Repairers, Indianapolis, Ind.

P. J. POTTER. JOHN W. HOFFMAN. WILLIAM TOOTHE. SOUTHARD HOFFMAN.

Potter, Hoffman & Co.,

110 Liberty St., N. Y.

GENERAL RAILROAD SUPPLIES.

AGENTS FOR

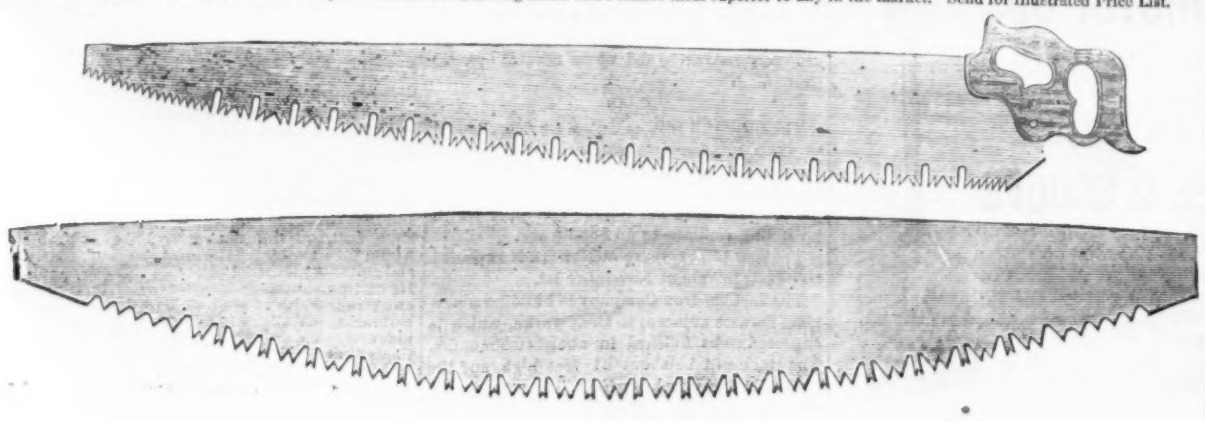
Bay State Iron Co., Boston Mass. Homogeneous Plates, Rails, &c. Crucible Steel Tires, Axles, Forgings, &c.

Chrome Tool Steel and Spring Steel. Nichols, Pickering & Co.'s Springs. Saxkear & Co.'s Patent Steel Tired Wheels.

J. FLINT & CO.,

Manufacturers of all kinds of SAWS and PLASTERING TROWELS, Rochester, N. Y.

A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for illustrated Price List.



E. M. Boynton,

80 Beekman Street,

NEW YORK,

Manufacturer of

LIGHTNING SAWS.

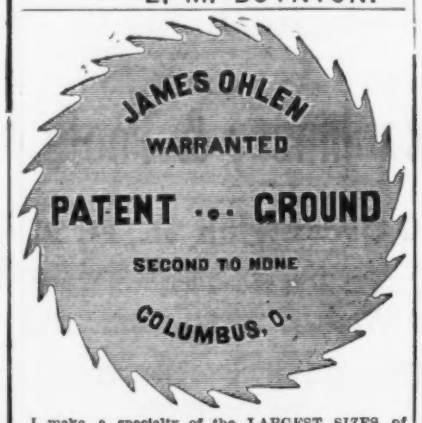
Two Direct Cutting Edges, instead of one Scraping point.

Note extra steel and durability over the old **V**, outlined on **M** tooth.

I am willing and extremely anxious, on proper notice, to accept a Challenge from H. Disston & Sons, or any responsible Saw Manufacturer, and am ready to back my words with appropriate deeds and $500 expense, if beaten.

N. B.---With Hand, Billet or Cross Cut Saw, $500 on each.

E. M. BOYNTON.



I make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

James S. Patterson,

Designer & Engraver on Wood.

21 Spruce Street, NEW YORK.

R. E. NEIL, President. H. A. LANMAN, Treas. & Manager. F. G. WADDEL, Secretary.

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COLUMBUS, OHIO,

Manufacturers of BEST NORWAY IRON

Carriage, Steeple, Cone, Shackle, Elliptic, Shaft and Tire

All the different styles used by the manufacturers of the finest Carriages. Every Bolt warranted true to size and fit. Illustrated Price Lists mailed on application. Our facilities are unsurpassed for the manufacture of **Machine Bolts and Coach Screws.** Correspondence from Car, Bridge and Machinery Builders solicited.

LIST OF HARDWARE DEALERS.

Having compiled a complete list of the **Hardware Dealers** in the United States, expressly for addressing circulars, I am prepared to receive orders for addressing **ENVELOPES, CIRCULARS, &c.** The printed address is cut from the list and stamped upon the envelope or wrapper, thus enabling me to address a great number in a short space of time, and at rates far below the prices usually paid for this work. It answers all purposes, and can be done for one-third the expense of addressing by hand. My list contains names of over 4000 dealers, each State, city and town therein, being compiled separately. Wholesale Dealers and Manufacturing Co.'s, whose custom it is to send out circulars, price lists, &c., to the trade throughout the States, cannot fail to find my list and style of addressing a great advantage to them, as it is a great saving of both time and expense. It has been tried by a large number in the trade, some of whose names appear at the bottom of this circular, and to any of whom I would most respectfully refer. My rate for addressing is $7·50 per M. Envelopes, &c., sent to the address below, will receive prompt attention, and will be addressed and returned at once, or envelopes, &c., will be furnished at market prices. For further information, address,

CHAS. B. SMITH, No. 115 Broad St., N. Y.

REFERENCES.

Union Nut Co., 73 Beekman St., L. Boardman & Son, 82 Chambers St., Millers Falls Co., 78 Beekman St., E. M. Boynton, 80 Beekman St., Yale Lock Mfg. Co., N. Y.

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NEW YORK, February 26, 1874.

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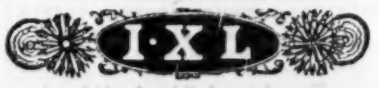

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PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, Sept. 7th, 1874.

The promise of an early improvement in general trade, and particularly in the iron trade, which was held out a fortnight since, has not as yet been made good, and we are still hoping and expecting that era of better things. With, however, a very marked and decided improvement over the condition of affairs three months since, a considerable party in this and other communities seems to have become affected with a moral dry rot in reference to business. Taking counsel of their fears, rather than their energies, this party steadily and persistently refuses to admit the possibility of a revival of business in a country which to day possesses all the elements of commercial prosperity, an increasing export trade, a balance of trade in her favor, an abundant harvest of cereal and textile supplies, and the coffers of the moneyed centers of the world opening to her opportunities for investment. The press is besieged with croaking articles, which inform us, despite the evidences of our senses, that nothing is doing or can be done until some mysterious lapse of an unknown period should, by an occult power, restore confidence between man and man. A great deal of this nonsense, to call it by no harsher term, is devoted to the misfortunes of the iron trade. From various sources entitled to more or less respectful attention, we are assured that the prices obtained for the iron product are without margin of profit; that the business will not and cannot revive before 1875; that the farmers cannot buy because of a good harvest, which will cause low prices for crops; in short, that material prosperity is the actual cause of commercial disaster, and similar paradoxes. Yet even a partial examination of actual facts does not bear out these fallacies. The best authority of Pittsburgh, the great center of the rolling mill trade of the country, states that more iron has been rolled in Pittsburgh during the spring of 1874 than ever before. Where is it? Not in the mills; not in the warehouses. Naturally consumed or in process of consumption. Even if at a small profit this iron has been made, it has kept the thousands employed who make it; has paid them the wages with which they have bought and consumed the crops of the farmer, and in turn enabled him to buy the product of their labor. The railroad companies have maintained their integrity in most cases, and have increased their facilities for transportation. The manufacturing industries may be depressed, but in the logic of facts we fail to find any confirmation of the jeremiads of the croaker party. On the contrary, turning over the "business notices" and "manufacturing news" of the trade journals, we find, as a careful collation and comparison of dates will show, more new works and new enterprises starting than was the case previous to the panic. Against the impossibility of any demand for iron, we find notices of exports of articles in quantity, just finished, and having consumed in construction large quantities of iron—statements of the following nature, which speak more for the recovery of trade than columns of speculations, viz.: The steamer Tagus yesterday (Sept. 2d), took out 8000 rifles for Turkey, and twelve locomotives for Russia. The former are part of a contract with the Providence Tool Company for 600,000 weapons of the same description. The Turkish government also has an agreement with the Winchester Repeating Arms Company, of New Haven, for 200,000,000 of cartridges. The *Journal of Commerce* says the Pratt & Whitney Machine Company, of Hartford, Conn., has a contract with the Prussian government for machinery sufficient to make 2,000,000 rifles of the new system adopted by that government. The machinery will cost over $1,000,000, and will be the most perfect set of gun machinery ever made.

In iron shipbuilding we find more work finished and commenced since the panic than ever before in this country. In other localities, a somewhat careful inquiry made within the fortnight past among manufacturers and business men of New York and New England, shows a very general impression that they are fairly busy at low but living prices. The great ore companies of New York, on Lake Champlain are resuming work; while at the furnaces there and on the Hudson iron is being loaded for delivery. Furnace owners report orders as coming in fairly from general consumers. An ore miner of the region referred to, just returned from a trip among Pennsylvania furnaces, reported a fairly active demand for ores, with orders for the production of his mines for some months to come. Throughout the whole region named, so far as casual observation would permit, the manufactories and business enterprises were fairly occupied. Nothing so much tends to prevent enterprise, interfere with success or deter activity than the unhappy spirit of lamentation over the present and distrust of the future, which already has overtaken such a considerable portion of our press writers. Without marking the exact period of a return to activity, this country will have glided naturally into a period of unexampled prosperity before these faint hearted ones shall have realized the possibility of such a change.

The gossip of the week presents some features of interest. The Centennial business was opened on the 5th instant by the celebration at Carpenter's Hall, in this city, the actual site of the occurrence of the assembling of the first Congress. In stock and railroad circles much interest is taken in the forthcoming report of the Committee of Stockholders appointed at the Annual Meeting to investigate the condition of the affairs of the Pennsylvania Railroad Company, which report will, it is said, show a very prosperous state of affairs, and under which news the shares are rapidly appreciating. In commercial circles a new corporation has been fairly launched for the purpose of manufacturing fuel from coal waste under the process of Mr. E. T. Loiseau. Several years since, when Mr. Loiseau first strove to introduce his patent fuel to the notice of coal dealers, in a modest room in Dock street, I noticed his process in your columns and predicted success. Under the auspices of the Lehigh coal men he has since greatly improved it, and now promises a full supply of the new fuel by December, at $1 per ton below coal rates. In my next I will speak further of this interesting invention. Down the river, John Roach & Sons have lately launched a new iron sloop of war, and have a second on the ways, while work has been commenced on three new steamers for the Pacific Mail Company. The Franklin Institute is progressing with the preparations for its coming exhibition in October favorably, and the display promises to be fine. Centennial work, both among the Commissioners and by the contractor, proceeds vigorously. The former are receiving encouragement both abroad and at home. The latter is pushing the building, and the mills supplying the iron for the exhibition buildings are running double turn.

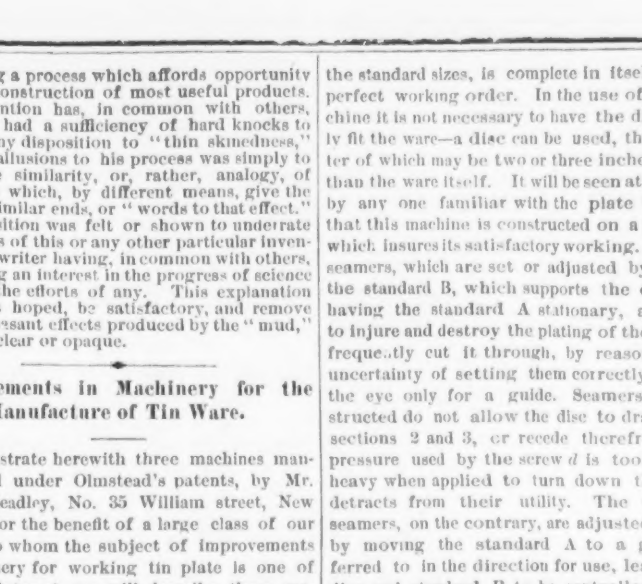
In your last issue, Mr. Elbridge Wheeler, of the Tubular Iron and Steel Association, and inventor of the process under which it works, takes me to task for comparing his method of working with that of another inventor, and expresses some soreness over my statements. Mr. Wheeler has undoubtedly succeeded in making, so far as I have seen his samples, a very thorough combination of steel and iron, and in perfecting a process which affords opportunity for the construction of most useful products. This invention has, in common with others, however, had a sufficiency of hard knocks to obviate any disposition to "thin skinedness," and my allusions to his process was simply to show the similarity, or, rather, analogy, of processes which, by different means, give the same or similar ends, or "words to that effect." No disposition was felt or shown to underrate the merits of this or any other particular invention, the writer having, in common with others, too strong an interest in the progress of science to decry the efforts of any. This explanation will, it is hoped, be satisfactory, and remove the unpleasant effects produced by the "mud," whether clear or opaque.

Improvements in Machinery for the Manufacture of Tin Ware.

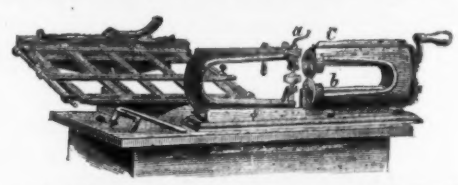
We illustrate herewith three machines manufactured under Olmstead's patents, by Mr. W. L. Headley, No. 35 William street, New York. For the benefit of a large class of our readers to whom the subject of improvements in machinery for working tin plate is one of especial interest, we will describe these machines somewhat in detail.

SETTING DOWN, DOUBLE SEAMING AND DEFLECTING MACHINE.

This machine requires no introduction among practical tinsmiths, as more than four thousand are now in use in the United States and Canada. It combines the setting down and double seaming of all kinds of tin ware. Deflecting is a process by which pans, pails, cans, &c., can be stiffened when desired. The devices by which this is effected can be attached or detached at pleasure of the operator, while the combination of a double seamer and setting down machine in one saves time, labor and expense. Looseness or tightness of the bottoms does not affect the setting down or double seaming by this machine. If the deflecting process be used upon the ware, which can be done at the same time with the double seaming, or thereafter, if desired, it will not spring when soldered, and if the machine be properly set for use it is impossible for it or the operator to throw a bottom off. The machine is 14½ inches deep, weighs about 100 lbs., is strong and substantially made, and contains brass boxes and cap. It is adapted for large or small work, straight, flaring or oval, light or heavy work, such as pans, pails, cans of every description, coffee pots, tea kettles, wash boilers, &c.—working readily on X, XX, XXX and XXXX tin, sheet iron or copper. The section of the dies and the setting down wheel are made of the best cast steel, and highly polished, so as to close the seam perfectly water tight, thereby saving more than one-half of the solder which must otherwise be used. The high polish of the steel dies prevents the injuring or marring of the plating of the tin ware. This, we believe, is the only double seamer in the trade in which sections of the dies and setting-down wheel are made of cast steel. Every machine includes a set of 8 discs, conforming to the standard sizes, is complete in itself, and in perfect working order. In the use of this machine it is not necessary to have the disc exactly fit the ware—a disc can be used, the diameter of which may be two or three inches smaller than the ware itself. It will be seen at a glance, by any one familiar with the plate working, that this machine is constructed on a principle which insures its satisfactory working. Double seamers, which are set or adjusted by moving the standard B, which supports the disc, and having the standard A stationary, are liable to injure and destroy the plating of the tin, and frequently cut it through, by reason of the uncertainty of setting them correctly, having the eye only for a guide. Seamers so constructed do not allow the disc to draw up to sections 2 and 3, or recede therefrom if the pressure used by the screw *d* is too light or heavy when applied to turn down the seam, detracts from their utility. The Olmstead seamers, on the contrary, are adjusted entirely by moving the standard A to a gauge referred to in the direction for use, leaving the disc and standard B to be controlled entirely by the pressure of the screw *d*, while the standard B, holding the disc, has its vertical position and lateral movement, as occasion may require. Thus, should the machine be incorrectly set, or the pressure too heavy or too light, no damage to the ware can be occasioned thereby. These peculiar advantages enable the Olmstead seamer to draw a bottom on tight, when loosely or even carelessly sprung on, so that it will not spring when soldered, even if it be not deflected.



OLMSTEAD'S SETTING-DOWN, DOUBLE-SEAMING AND DEFLECTING MACHINE.



WAUGH'S COMBINED BEVEL, SQUARE AND CIRCULAR SHEARS.

OLMSTEAD'S DOUBLE SEAMING AND DEFLECTING MACHINE.—NO. 2.

DOUBLE SEAMING AND DEFLECTING MACHINE, NO. 2.

Our illustration represents a machine weighing about 100 lbs., standing fifteen inches high from the base. It works on the same principle as that before described. It has eight discs, is made with brass boxes, and is warranted to do the work for which it is designed with the greatest accuracy. It requires no special description.

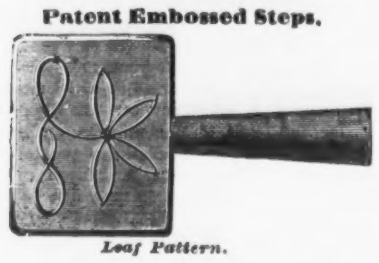
COMBINED BEVEL, SQUARE AND CIRCULAR SHEARS.

This machine is also manufactured by Mr. Headley, under Waugh's patent, and is recognized as standard. It will cut any circle, square, bevel or straight work, and can be changed from one style of cutting to another in a moment. The cutters are set at such an angle as to keep themselves sharp by friction, an advantage which is secured by having the circle disc, which holds the cutters, stationary. More cutters are worn out by being set wrong than by the work they perform.

To change this machine from circle cutting to squaring, it is only necessary to slide out the circle disc, which is held in the groove at the base by a thumb screw, and place the bevel and squaring carriage in the same groove. Each machine includes a rim gauge, which can be attached to the lever shear head *b*, for cutting cover hoops or rims, either bevel or straight, by describing the pattern of the rim desired, turning the crank and letting the tin feed through. It will cut light or heavy tin plate, copper or other sheet metal. Two sheets can be cut at the same time if desired.

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



Leaf Pattern.

Star Pattern.

Established 1850.

King Bolt Yokes.

No. 6 Fifth Wheels.

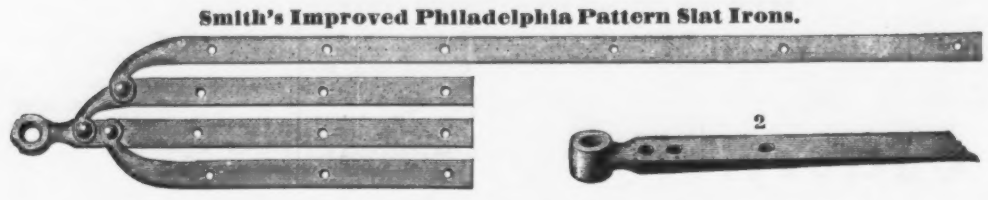
1871 Pattern Shaft Couplings.

Patent Cross Bar Steps.

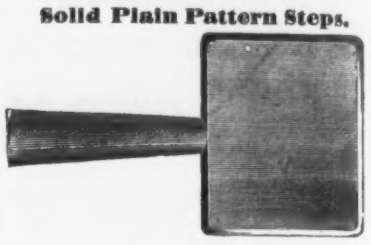
Upper View.

Lower View.

Smith's Improved Philadelphia Pattern Slat Irons.



Solid Plain Pattern Steps.



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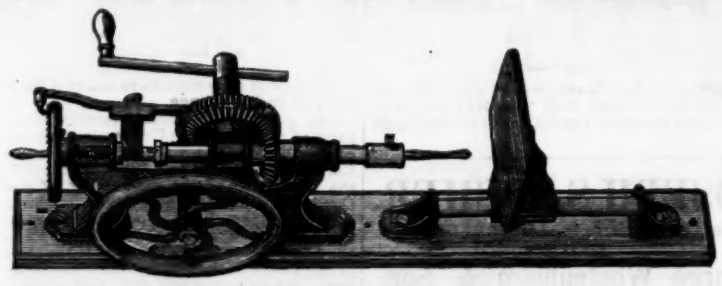

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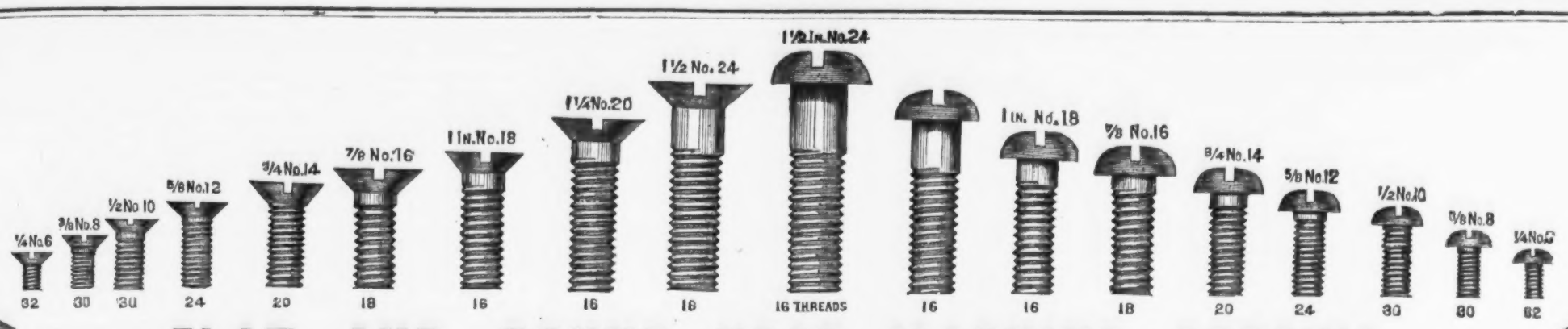

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AND LENGTHS - - 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/4, 1 1/2 INCH.

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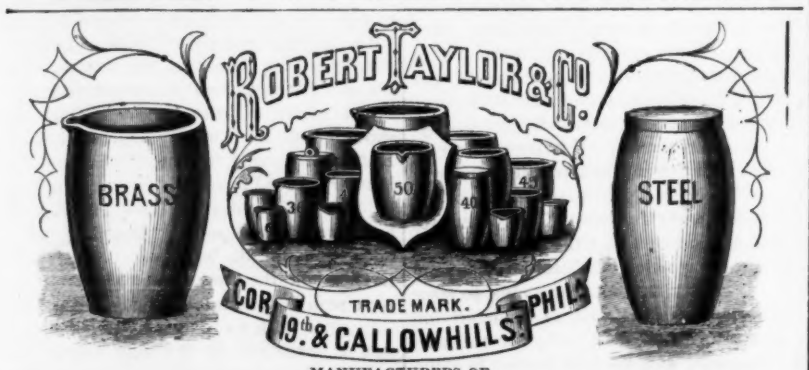

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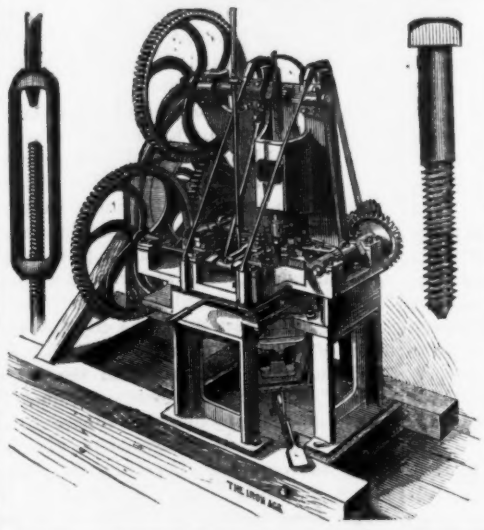

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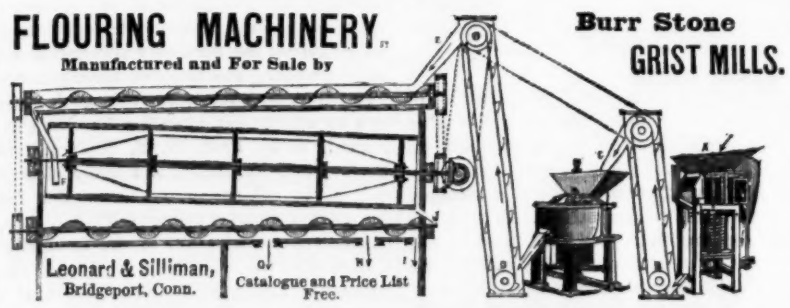

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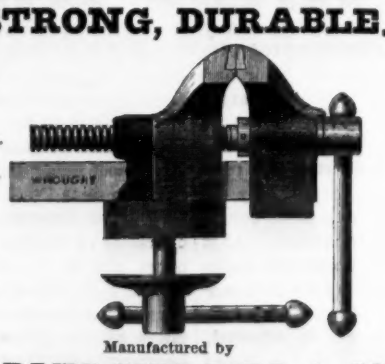

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New York, Thursday, September 10, 1874.

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CONTENTS.

The Iron Outlook.

The old proverb which has it that "all signs fail in time of drought," might apply with even more truth to times of extreme commercial depression. During two months following the panic there were reasons to believe that its effects would be of brief duration, and that, while a dull winter was inevitable, the spring would witness a general revival of industrial and commercial activity. Spring came, but the promise was unfulfilled. During the summer there was much in the general course of events upon which to found a hope that the fall trade would compensate, in part at least, for the losses of the preceding nine months. The fall is here, but it comes almost empty handed, and the opinion prevails that we cannot look for any general revival of business, with a profit to manufacturers, before spring. What that season of hope will bring us remains to be seen. The pendulum of the iron trade, which reached the end of its stroke in the direction of prosperity during the summer of 1872 and the spring of 1873, must by this time have traversed the limit of its beat in the opposite direction, and it cannot long hang suspended where it is. This is small encouragement, we know, but it is all we can offer at this time. During the seven months ended with August only 916 miles of railroad were built, against 2029 and 3485 for the same period of 1873 and 1872 respectively. Expenditures for renewals and repairs show a falling off almost as great as that for construction, and it must be confessed that there is no immediate prospect of large increase in the consumptive demands from this source. The panic has shaken the confidence of small investors in the security of railroad shares and bonds, and those with capital at command, who might push forward the great work of internal development until confidence was restored, are deterred from doing so in several States where additional transportation facilities are most needed, by the silly clamor of demagogues and their following for State and national regulation of railway management and an arbitrary adjustment of tariffs to suit the views of shippers of freights. In other departments of industry the stagnation in general trade, and the limited demand for finished products, has reduced the demand for iron to a minimum. In addition to this, public works of all kinds and great engineering enterprises conducted at public expense, drag from the disinclination of local governments to impose the taxation needed to insure their prompt completion. Everybody feels poor. Capital locks itself up in safe and cautious investments, and there is, if anything, less confidence felt in the immediate future than was manifested during the first few months after the panic. While this condition of affairs lasts, we cannot look for a renewal of activity.

There are but two things for the manufacturer, whether of iron or of other commodities, to do under existing conditions. One is to push trade with more than ordinary enterprise, and the other is to study a close and systematic economy in every department of business. The one will bring its sure return, sooner or later; the other will enable them to reap the larger profit during seasons of average prosperity. The reasons for the former we have already given at considerable length in a previous issue. The importance of the latter does not need to be established by argument, but we shall endeavor in a future article to point out the necessity for an attention to minor details which, in times of prosperity, are too often neglected, but which, in the aggregate, are great make-weights in the scale of profit and loss.

The Smoke Nuisance.

We are informed that an effort is to be made to secure the enactment, by the City Council of Cincinnati, of an ordinance providing that on and after the 1st of January, 1875, no manufacturer shall be permitted to burn more than five bushels of soft coal daily without providing means for consuming the smoke generated by his furnaces. Violations of this provision are to be made punishable by a fine not exceeding fifty dollars, and ten dollars per day additional during the further continuance of the nuisance.

If any such ordinance is enacted, it will be a dead letter on the statute book. The best thing the City Council of Cincinnati could do, would be to request the Mayor to appoint a Commission of experts to consider the question of preventing the formation of smoke in furnaces, and devise some plan of accomplishing that object which can be adopted at small cost by those to whom the proposed ordinance shall apply. As it is, we suspect that some one interested in a patent smoke consuming apparatus is chiefly instrumental in securing its passage, with a view to forcing manufacturers to purchase his device.

When the nature and constitution of what is known under the comprehensive name of smoke, is better understood, we shall have less of foolish legislation on the subject. All that comes out of a chimney is not smoke, by any means. Bituminous coal contains from five to six per cent. of hydrogen, which unites with the oxygen necessary to combustion and makes water. A ton of bituminous coal will make nearly half a ton of water, in the form of steam. That this steam is black does not necessarily indicate the presence of much carbon, as a grain of soot, if distributed evenly, in fine particles, through a cubic foot of steam, would color it blacker than any thunder cloud ever seen, or, if mixed with a gallon of water, give it the color and opacity of ink. Now it requires no argument to show that this steam cannot be burned. It may be condensed by being made to pass through tubes kept at a low temperature, though a draft could only be maintained artificially under these conditions, but it cannot be consumed. If it were possible to separate the carbon atoms from the vapor in which they are held suspended, they could be burned, but such a separation could not be effected, and if it could, the amount of fuel saved would be so infinitesimally small that it would not repay one per cent. of the cost of retaining it. When smoke is once formed it cannot be burned, and a law which decrees that it shall be, is on a par with the decree of King Canute, fixing the limit to which the tide should be permitted to rise. The prevention of smoke, however, is a very different matter. The products of combustion under average conditions are:

1. Steam highly rarified and incombustible.
2. Carbonic acid, also incombustible.
3. Carbonic oxide, invisible but combustible.
4. Solid matter, in part combustible.

The first two are the products of complete combustion; the last two of incomplete combustion, and are all that we need consider here. Carbonic oxide is formed from that portion of the carbonic acid which has taken up an additional portion of carbon, which converts it from an acid into an oxide of carbon. This additional portion of carbon requires for its combustion as much oxygen as was required to form the acid. Smoke is composed of such portions of the hydrogen and carbon as have not combined with oxygen, and consequently have not been converted into steam in the one case or carbonic acid in the other. To intercept the formation of these substances in the furnace is the problem which the manufacturer who desires to suppress the smoke nuisance is called upon to consider.

As we have before said in these columns, in previous discussions of this much misunderstood question, all that is needed to accomplish this is to introduce air into the furnace at the proper time and in the proper quantity. It must not be supposed, however, that because the problem is so simple it is easily solved. Not one manufacturer in a hundred, if required to suppress this smoke nuisance, so far as his own chimneys are concerned, would have any clear idea of how to proceed to do it, even though his own reward, in the event of success, would be a saving of fuel which would be an important item of economy. A great many experiments would be tried, but a lack of knowledge of the principles involved would, in a majority of cases, render success impossible. As we before suggested, the best thing the city government of Cincinnati, or Pittsburgh, or any other city suffering from the nuisance of sulphurous and tormenting smoke, could do to promote its suppression, is to appoint a commission of experts to consider the subject fully and intelligently, and, if possible, to devise some means of admitting air to furnaces which would admit of general application, and impose upon manufacturers who might adopt it an expense not greater than the saving of fuel which would result from its use. From such a course of procedure we might expect some practical results, which will never be reached by the short and easy method of "Be it enacted, that after such a date all smoke shall be consumed, or penalties will be imposed." Let the councilmen of the cities desiring to rid themselves of the smoke nuisance first determine whether it can be done, and if so, how it can be done, for it is certain that manufacturers do not know and are not otherwise likely to find out.

The Green River Iron and Coal Region of Kentucky.

The importance of State geological surveys in the discovery and location of mineral deposits is daily more generally appreciated by the people of our country, until few, if any, of the State legislatures longer refuse the necessary appropriations for the work. The latest of these services which have been rendered by the geologists, and to which our attention has been attracted, is by Prof. N. S. Shaler, State Geologist of Kentucky, and lately elected one of the officers of the Association for the Advancement of Science. Prof. Shaler, in a late communication to the Louisville *Courier-Journal*, calls the attention of the citizens of Louisville to the existence of a series of iron ore and coal deposits in the easternmost part of the Green River coal field of Kentucky, the importance of which discoveries to the iron industry of the whole Southwest are sufficient to justify a description of the region for the benefit of the trade at large. Writing from the camp of the surveying party in Edmonson county, Kentucky, Prof. Shaler states that the task of the Western party of the survey has been to determine the character of the deposits of coal and iron in the Green River coal field, and that in the territory between Bear Creek and the Nolin River they have determined the position and character of sources of ore supply for furnaces, and of coal mines unexcelled by any in the State of Kentucky. The territory here referred to lies along and within a few miles of the Green River slack water improvement, which affords water navigation 185 miles to the Ohio River at the mouth of Green River, 12 miles above Evansville, 180 miles below Louisville, and 375 miles from St. Louis, all water transit. A local improvement company, the Bear Creek Mining and Manufacturing Company, has projected a three foot gauge railroad to connect this navigation on Green River with their lands, and furnaces when the latter are erected. The Green River Navigation Company proposes to freight pig metal from this point to Louisville at the rate of $1·50 per ton. From this region a railroad, 14 miles in length, will tap the Louisville and Paducah Railroad at Grayson Springs, making the distance by rail to Louisville 82 miles. A railroad of 28 miles will reach the Louisville and Nashville Railroad at Bowling Green, Kentucky, making the distance from the ores and coal mines to Nashville 85 miles, and placing the coal 15 miles nearer Nashville than any other coal now accessible to that city. These coal mines are also thirty miles nearer to Louisville, via rail to Grayson Springs, than any other coal which can be reached from that important manufacturing city. Owen, in his Geological Reconnoissance of Kentucky, in 1859, reports the ore here as bearing 47 per cent. of iron, and coal with 59 per cent of carbon. Limestone and timber are also abundant. The cold blast charcoal metal made on Nolin River as late as 1850, bore a very high reputation for quality. Mining and furnace labor is abundant at the rate of $1 per day, and the region is well cultivated and fertile. For these facts we were indebted to private authority of the utmost reliability, before the examination of Prof. Shaler's survey during the present summer. Of the value of the region as an industrial center, Prof. Shaler says that at least three veins of workable coal of good quality for steam purposes and sufficient thickness for profitable working, have been satisfactorily identified. One of these is five feet in thickness, admirably disposed for drainage, and can be cheaply mined. Analysis shows that it will answer well for coking and use in iron smelting. The two other coals have not yet been sufficiently studied to determine their value. Of the iron ores, the same authority states that not less than five different beds appear at various points on the sides of the hills. One of these, of three to five or more feet in thickness, of oolitic ore, contains 37 per cent. of metallic iron in a favorable combination for making metal of good quality. This lead has already been traced over an area of about twenty square miles, and will in itself furnish an abundant supply of ore for a great many furnaces. Two other ores promise good results, although, owing to the densely wooded condition of the country, the survey has not been able to trace their whole area, as well as the overlying oolitic ore. Timber suitable for the uses of the miner and the iron worker is abundant, limestone of excellent quality for furnace use is found at the base of the hills on the Nolen side, and stone suitable for the masonry of furnaces can be had at every point. To prevent the wealth of this region being diverted to Evansville or St. Louis, Prof. Shaler makes an eloquent appeal to the people of Louisville, in which he utters the sound, economical truth that a prosperity founded on exchange of products can never be so well and surely based as when it rests on production itself. From this region, he argues, it is possible for Louisville to secure as substantial a basis for manufacturing industry as any city in America. Of the locality he states: "I have been surprised, despite my high "expectations at its richness, at the ease "with which access can be had to its "wealth, and at the variety of products it "promises in the immediate future. Here "is a noble river with an unfailing water "power, which in that source of wealth "should be to Louisville what the Merri"mac is to Boston; here are 4000 square "miles of the best coal and iron in the "West, a good soil, noble forest of manu"facturing woods, and a good climate. "Make this region tributary to Louisville, "and its future is secure, for it will rest on "the substantial industries of production."

Another authority informs us that a shaft of 150 feet in depth will here pass through three beds of ore and four of coal, both of excellent quality, the seams of coal being from twenty-seven inches to five feet thick, and the beds of ore from five to seven feet thick. Whether the citizens of Louisville profit by the eloquent and wise counsels of their State geologist or not, it is clearly evident that a region possessed of such great natural wealth as that here described will not be long neglected by the iron trade of the West. In previous articles we have impressed upon our readers the necessity for the use of care and judgment in the selection of proper sites for the erection of the iron works of the future, and it is in just such regions as that here described that we are to look for the sites which shall combine abundant raw material with cheap methods of transportation to a near-by market. The fact that the industry is temporarily prostrated in no way militates against the policy of securing such localities for future operations, while those who have watched the investment of foreign capital in this country for the past year have found it to have invariably sought similar regions.

Our Shipping Interests.

The National Board of Steam Navigation, at their recent session in Buffalo, passed without a dissenting voice a resolution which shows that the ship owners have come at last to take a correct view of the operations and benefits of the law excluding foreign tonnage from the benefits of American registration. The following is the resolution:

Resolved, That since the last session we have witnessed with pride the evidence of a revival of American shipbuilding in various parts of the United States, and the unprecedented increase of tonnage for employment in the foreign trade, giving proof that the skilled artisans of our country still take high rank among their competitors abroad; and it only remains now for our national legislature to assure this interest its fostering care to induce capital to seek investment in steam tonnage, and thus in a short time for our nation to regain its wonted just and proud position among the maritime nations of the world.

There was a time, between the decline of wooden shipbuilding and the establishment of the business of iron shipbuilding in this country, during which our shipowners, as a class, were disposed to regard the registry law as an obstacle to the restoration of our merchant marine. "Is shipbuilding everything and ship owning nothing?" was the question with which they met all arguments in favor of the registry law. They pointed to our commercial importance in the good old times when our clipper ships sailed after teas and beat the world for good sailing with large cargos, and insisted that the establishment of a prosperous shipbuilding industry, good as that might be in itself considered, was of small importance compared with profitable competition for the carrying trade. The argument was the same that has always been advanced against protection, namely: that while home industry is good, its development is of secondary importance to the establishment and maintenance of a trade with foreign countries. Had Congress yielded to the clamor of the ship owners, we should have had a somewhat larger ocean steam marine, perhaps, but we should have been wholly dependent upon British ship yards for our vessels, and the industry would never have attained a foothold in this country—at least, not until it had received the same "fostering care" once denounced, but now commended. Even when the first fruits of protection were seen in the establishment of American shipyards with a capacity for the construction of large vessels, the ship owners, especially those interested in foreign trade, were the last to believe that American tonnage could ever compete with British. They told us that iron steamers could be built on the Clyde from 25 to 50 per cent. cheaper than they could possibly be built on the Delaware, or any other American river, and that an American line of steamers could not by any possibility be made to pay in competition with a British line. Presently our shipwrights got to work on iron vessels for the coasting trade, and our shippers were confronted with the fact that, all things considered, they were better and cheaper than English bottoms. Then certain enterprising capitalists ordered ships for the Atlantic and Pacific trade, and the startling fact became apparent that protection had done all that its warmest advocates had promised, and that the American shipbuilding industry was established on a firm and enduring basis. Now our ship owners, like reasonable men, forget their prejudices, and in a council at which our shipping interests are fully represented, they acknowledge having witnessed with pride the revival of shipbuilding and the unprecedented increase of our ocean tonnage, and in formal resolution ask Congress to assure the shipbuilding industry a continuance of its fostering care, to the end that the United States may the sooner "regain its wonted just and proper position "among the maritime nations of the "world." This is as it should be.

We have indulged in this retrospect, not with any desire to remind our ship owners of an opposition to protection which they are now disposed to forget, and for which no one will deny them cordial and absolute forgiveness, but merely to show that protection to home industry is more than a theory. As a system it is as certain in its operations, and while the results sought are not always so quickly reached as in the case of iron shipbuilding, it never fails to establish upon a broad and sure foundation every industry to which its benefits are extended. Let us not be impatient. "Rome was not built in a day" is a proverb familiar to childish ears, which should not be forgotten in maturer years. A great and diversified industry, bringing wealth and power to a nation, is not built

up in a year, nor often in a generation. Surely the tariff has done enough in increasing the aggregate of our manufactured products more than one hundred per cent. during the decenninal period ended with 1870. No one ever claimed it would do so much, and the prophets of evil who saw only disaster and ruin as the result of an effort to build up our home industries at the expense of our foreign trade, have prophesied falsely. Let us give protection a fair chance for what it has already done, if for no other reason, and many years will not pass before those who now clamor most loudly against "monopoly" will, like the ship owners, view with pride and satisfaction its manifold benefits, and ask that Congress shall continue to home industry the same protection which has done so much for the country.

Scientific and Technical Notes.

A correspondent of the Pittsburgh *Commercial* thus describes the

NATURAL GAS IN THE CONEMAUGH VALLEY.

During the past ten years the attention of the writer has been frequently called to what is known as gas springs along the line of the Kiskaminetas and Conemaugh River. These springs are found at various points along the aforesaid river from Blairsville to its junction with the Allegheny, near Freeport. At some points these spring are so strong as to throw water to a considerable distance above the surface of the stream, and produce a seething, rumbling sound, resembling the boiling of a vast cauldron many feet beneath the surface. Many years ago these gas fissures formed the principal barrier to the salt producer in drilling his wells, and many well authenticated instances may be cited where parties where compelled, on account of the strong flow of gas, which, in some instances, would throw water as high as the tops of the surrounding trees, to abandon half drilled wells and seek other locations for their enterprise. At that time it was thought that these deposits of gas were formed from the immense coal beds which were known to exist in the surrounding hills, but latterly they are supposed to indicate vast deposits of petroleum many hundred feet beneath the surface; but from what ever source they may come, we are now only interested in the fact that they do exist, and the great question is, can this unceasing stream of self-constituted bicarbureted hydrogen be made subservient to man's uses as a fuel, instead of coal, in the manufacture of the minerals with which the valley of the Conemaugh so richly abound. Only one test of this has so far been made. We refer to the one at Leechburgh. At this place, some years ago, a company was formed for the purpose of testing their territory for oil; a well was drilled to the depth of nine hundred feet, when they struck a reservoir of gas so powerful as to render it impossible to prosecute the work any further. The company abandoned the well, but afterward sold it to Messrs. Rogers & Burchfield, who own a rolling mill at that place. They conveyed the gas in pipes from this well to their works, and are now running their mill entirely with gas instead of coal, at a saving to them of many thousands of dollars a year; and so satisfactory has this enterprise proved, that these gentlemen are now engaged in drilling a well at Apollo, with a view to getting gas with which to run their mills at that point.

So far, then, as gas wells are concerned, it has already been demonstrated that, as a matter of fuel alone, they will save to the manufacturer many thousands a year, beside this he gets rid of the dust, dirt and smoke, which coal, as a fuel, produces. He can also light his works at night with the gas from his well, and it is claimed can produce a much better quality of iron. The next question is, Can this surface gas be so concentrated as to be useful to the manufacturer as a fuel? Of this we have not as yet seen any practical tests, that is, we have not seen it gathered into reservoirs, and applied to heating furnaces, driving machinery, &c., but we are satisfied that it only requires a little skill and money to render it fully as useful and efficient as the gas procured by drilling wells.

A few days since, in company with several gentlemen, we visited the farm of Keir Bros., at Salina, on the West Penn Railroad, four miles West of Saltsburg, on which it was reported one of these springs was located. On arriving we found that one of the workmen on the farm had erected, over the fissure through which the gas escapes, a small clay oven, which formed a sort of reservoir in which the gas could collect. On the top of this oven was a small hole about the size of a straw, through which the gas could escape. On applying a lighted match to this hole we were surprised to see a flame of fire burst forth—strong enough, in our opinion, to run any ordinary sized manufacturing establishment. We lighted the gas about nine o'clock a. m., left it burning, and returned about three p. m., when we found that instead of the fire having gone out, as some of our party predicted it would, it had increased materially through the influence of the heat, while the rocks in the immediate vicinity of the flame were so warm that we could not touch them with our hands. Messrs. Kier Bros. are now erecting a large fire brick works on the farm, and will most assuredly test the value of this spring. Our opinion is that they will get from it gas enough to burn their brick, boil the salt from three wells near by, make steam for their motive power, and have enough left to light a town. This locality abounds in fire clay, limestone, coal and salt.

This is only one of very many farms along the line of this river which offer the advantages spoken of, and our object in writing this letter is to call the attention of our manufacturers to this important fact. This undeveloped source of wealth cannot lie uselessly hidden away much longer. Already the hand of progress grasps the key to unlock this vast treasure house, and ere long we expect to see our beautiful valley lighted up with blazing forges, and hear it resounding with the unceasing clink, clink, of the sledge and hammer.

An exchange describes the newly utilized

GAS WELLS NEAR MATTOON, ILL.,

as follows:

About three miles from Mattoon, Ill., is a gas well which furnishes its owner with thousands of cubic feet of light and fuel. The well is on the Champion farm, and is just back of the house in which Mr. Champion and his family live. Two years ago Mr. Champion began boring for water. After sending his drills down forty feet or more, no sign of water having been reached, he drew them out intending to bore somewhere else, but as the last section of the drill left the hole which had been made, up rushed a stream of carbureted hydrogen gas with a roaring sound that was heard more than five hundred yards away. The air was filled with the stench for several days as the malodorous fluid came pouring out in a seemingly exhaustless volume; but at the suggestion of one of the many hundreds who had been attracted to the spot, a wisp of lighted straw was applied to the current, and very naturally, in a few moments the atmosphere was purified. But the contact of fire with the rushing gas resulted in a loud explosion that startled the neighborhood, and when the wide spreading sheet of fire which for a moment stretched above the heads of the bystanders had disappeared, there was seen shooting upward to the hight of thirty feet, a column of fire two or three inches in diameter. This immense gas jet was visible to residents of towns five and six miles distant from the well, and was the subject of much wonderment, of course.

It was two or three weeks before Mr. Champion thought seriously of utilizing the gas works which nature had so thoughtfully established right at his door. He sent for a plumber and had gas fixtures put up in every room in his house. Then he ran pipes into stoves and fire-places and grates, and having laid a main and sunk a two inch pipe into the mouth of the gas well he made the necessary connection, filled in around the opening of the well with clay and earth, and was now ready to put to practical test the great gift so unexpectedly received from the under world. He lit the gas in his parlor, his bedrooms, and his kitchen, and was delighted. It burned with a clear, white flame, and gave forth neither smell nor smoke. He turned it on in grate and fire-place and stove, and touched a match to the out flowing currents. The result was more gratifying than he anticipated. In a few minutes the coldest rooms were nicely warmed, and the stove was hot enough to brown the stoutest roast. Since that time there has been a never-ceasing flow of gas. Mr. Champion has purchased no candles, no wood, no coal, from that date to this. He has run no risks from defective flues or kerosene oil explosions, and smoky chimneys in his house are an impossibility. A short distance from Mr. Champion's farm lives a Mr. Dole, who has just struck gas on his place. The well which he has opened is almost as strong as Mr. Champion's, and it has been proposed that they should combine the forces of the two wells, form a stock company, and supply Mattoon and the surrounding villages with gas.

MELTING AN EXTRAORDINARY MASS OF PLATINUM.

The largest mass of the alloy of platinum and iridium that has ever been melted at one operation was recently fused at Paris, in the presence of the Executive Committee of the National Metric Commission. This mass of the alloy in question was intended to be run into a mold of such shape as to afford, eventually, a number of new line standard meters, which will all be cut from this single ingot, and it is expected that the surplus metal will even then be sufficient to make all the required new standard weights or kilogrammes, and a number of end standard meters. The weight of the great ingot in question was 550 pounds avoirdupois, its length about 45 inches, its breadth 6 inches, depth 2¾ inches. The process of melting was facilitated by first dividing the material into small pieces; a small quantity was then melted, and to it were gradually added the remaining portions in the form of long thin bars. The heat required was obtained by means of an oxyhydrogen furnace fed by six gas tubes, each about one inch in diameter, and supplying the ordinary illuminating gas, and another set of tubes which furnished the requisite proportion of oxygen. The latter gas was made on the premises and stored in a large gasometer. For obtaining a sufficient blast, the power of a 15 horse steam engine was employed. The time actually occupied in melting the entire mass of 550 pounds was one hour and three minutes, of which the first 40 minutes were occupied in melting the first half of the material.

LIPPMANN'S SMALL ELECTRO-CAPILLARY MOTOR.

The following fact has been applied by Lippmann in the construction of a very novel, small motor, producing 100 revolutions per minute, and which is so exceedingly sensitive to the slightest electrical current that its use for electrometrical purposes is suggested, as well as its possible adaptation to the reception of messages by ocean cables. If a globule of mercury, several millimeters in diameter, covered with water acidulated with sulphuric acid, and but slightly colored with bichromate of potash, in a glass or porcelain vessel, is touched on the side with an iron point, it at once contracts, thus altering its shape, again expands until it touches the needle point, then again contracts, and so on, giving rise to curious reciprocating movements. This peculiar effect is due to the alternate oxidizing and deoxidizing effect of the bichromate and iron on the mercury, whereby its capillary properties are modified; and a similar phenomenon is produced when the mercury is alternately connected with the positive and negative poles of a galvanic cell. In applying the force thus generated, on a large scale, Lippmann placed two vessels of mercury in a glass trough filled with acidulated water, and with pistons composed of capillary tubes filled with mercury, inserted into the vessels of mercury; the alternate contraction and expansion of the mercury in the pistons, as they are connected with one or the other pole of a galvanic battery, furnishing the motive power in the case.

The Virginia *Enterprise* describes

AN INTERESTING GEOLOGICAL DISCOVERY

as follows: In the bottom of the main shaft of the Virginia City Coal Company, El Dorado canon, Lyon county, has been encountered the trunk of a large tree four feet in diameter—a lone relic of an ancient and extinct forest. Where cut through by the shaft this old tree is found to be perfectly carbonized, turned into coal. Outside the old log is completely crusted over with iron pyrites, many of which are so bright that the crystals shine like diamonds. These crystals also extend into the body of the log, filling what were once cracks or windshakes, and even forming clusters about what once was the heart of the tree. This relic of an old time forest lies far below the two veins of coal the company are about to open. The finding of this old trunk is evidence that the country was at some time, ages ago, covered by a forest of large trees; though the native timber growth, when the country was first visited by the whites, and as far back as the traditions of the Indians extend, was but a scrubby specie of nut pine. A few miles from the shaft in which this carbonized tree was found are to be seen on the surface the petrified remains of many large trees. The water lines on the hills show that the whole country was filled with lakes, and the petrified trees lying here and there on the surface of the ground probably floated out on the water of the extinct lakes, and finally sank to the bottom in the places where they are now found.

There is now in operation in Glasgow a

SELF-STOKING, SMOKELESS FURNACE,

which is thus described in the Glasgow *Herald:* It meets the case more thoroughly than any invention of a similar kind that has hitherto come under notice, and is as simple in construction as it is efficient in operation. The coal is placed in a hopper, over the front part of the furnace, into which it drops in small quantities through a couple of apertures. It is not necessary to open the front door of the furnace, except to see how the fire is getting on, for by a simple mechanical readjustment the man in charge of the furnace may regulate the quantity almost to an ounce. As it is added to from above, the coal sinks down, and slides slowly until it reaches the bars from the bottom of the furnace. These bars are acted upon by plungers, which carry them forward together, with their layer of cold on the top, and then, an eccentric being applied, every third bar in the series is brought back to receive a fresh supply. In this systematic and continuous way the furnace is fed with coal, which passes right through in slow and easy stages, the same quantity of fuel being at all times in exactly the same state. Combustion is, therefore, perfect; the smoke is burnt up, and the waste fuel is discharged, in the form of clinker or slag, into the ash pit.

Acid Tests for Irons and Steels.

BY PROF. F. KICK, OF PRAGUE.

We have, for a long time past, turned to account the action of acids on iron and steel, in order to ascertain their quality; but this action teaches us something further: it enables us to draw conclusions as to the regularity of the process of manufacture which has been adopted, and from this point of view it deserves a wide application.

Iron is, as is well known, attacked by all the common acids, and this action takes place in each of its numerous varieties, as wrought iron, cast iron and steel; sometimes, however, portions are found which are scarcely, if at all, attacked by the acid, that is to say, passive; a property which is dispelled by bringing them to a red heat, and which has, beside, no connection with their good quality, since the best wrought irons and the closest grained steels are acted upon by acids.

METHOD OF APPLYING THE TEST.

After several experiments with nitric, sulphuric and hydrochloric acids, and their combinations, with mordants composed of the salts of copper &c., Prof. Kick has arrived at the conclusion that a mixture of one part of hydrochloric acid with one part of water, to which is added a trace of a solution of chloride of antimony, constitutes a mordant especially applicable to this purpose. The last ingredient, which was recommended to him by Prof. Gintl, renders the surface attacked more capable of resisting oxidation, and has the effect, after well washing with hot water, and the application of a coat of protecting varnish, composed of Damar resin, of preserving the surface attacked sufficiently pure.

The method of proceeding is always to surround the surfaces, previously prepared by means of a file or hone, with a wall of wax fully ¾ of an inch high, in the same way that copper plates are prepared for being eaten in with acid in engraving; the acid, heated to a temperature of 53° to 86° Fahr., is poured on to the surfaces, and soon begins to act, as will become manifest by the disengagement of gas. In winter, owing to the low temperature, the operation cannot be performed so favorably. Its duration is usually from one to two hours, and it should be continued, as a general rule, until the texture of the iron be exposed. The progress of the action may be easily ascertained by pouring out the acid every half hour without breaking the wax border, removing by means of a brush or piece of rag the carbon (graphite) deposited on the surface, washing, and again pouring on more acid if the action appears insufficient.

If the chloride of antimony has been added to the acid in proper proportion, but little time will elapse, after the action has commenced, before it will begin to throw down a black precipitate. This is easy to distinguish from the graphite, inasmuch as the latter is not very appreciable, when, for about 1¾ pints, is only added a single drop of the concentrated solution of chloride of antimony, which is sufficient.

When the action of the acid has been continued long enough, the wax wall is destroyed, and the surface of the iron is washed by means of a brush, with several waters, the first of which is rendered slightly alkaline by the addition of a little lye; it is then carefully dried, and a coat of varnish is applied. If, at the end of a few hours, there are any signs of oxidation, the varnish must be dissolved with spirit of turpentine, the oxide removed, and the varnish again applied.

INDICATIONS GIVEN BY THE DIFFERENT KINDS OF IRON.

Soft or Fibrous Iron.—When of very good quality, this iron is attacked by the acid, even when the action is continued for several hours, in a manner so uniform, and with an elimination of the carbon so limited, that the surface acted upon retains a dull lustre; a few incised specks and cinder like holes being only observable.

Fine Grained Iron gives exactly the same indications; the surface generally remains uniform, but it is not quite so bright.

Coarse Grained Iron and Hot Short Iron are attacked by the acid with much greater energy than the two kinds above mentioned. Even at the end of about ten minutes, the surface, especially that of the latter kind, becomes quite black. If the acid be allowed to act for nearly half-an-hour, a black muddy deposit (*schlamm*) may be removed by washing, and no amount of washing will prevent the surface from remaining black; there will also be a considerable number of small holes distributed over the surface. Some portions of the iron are generally attacked more deeply this way; others, although they may have become black and a little porous, are better preserved. This appearance will be the more manifest if, after about an hour's action, repeated washings and drying, a fine file be passed over the surface.

Malleable Iron or Annealed Iron becomes rusty, as is well known, more readily than wrought iron; but an interesting fact is that the action of the acid is very violent and irregular.

Puddled Steel.—The color, after being treated with acid and washing, is gray, and of a tolerably uniform shade, the weldings being but little apparent.

Blister Steel.—The appearance exhibited is very like that of puddled steel, and the weldings are also but slightly apparent.

Bessemer Steel, Cast Steel.—The surfaces of these steels are uniformly gray, the non-homogeneous parts are rare, and but little apparent. The softer the steel the more approaching to gray is the color. The action of the acid produces very fine fissures. In a sample of Mushet steel, the prepared surface was perfectly uniform, but after the treatment with acid, narrow transverse fissures were observed over the whole extent. It is probable that the proportion of titanium in this steel was the cause of the surface attacked presenting the dark gray color.

Cast Iron.—Gray cast iron gives the same indications as steel. The attacked surface presents a tolerably uniform dark gray color. In spotted cast iron the white portions remain lighter, and the projecting particles of gray cast iron appear distinctly, like black specks or spots.

The cases enumerated above will show the indications given by the principal classes of iron when treated with acid, and therefore the phenomena afforded by pieces composed of different kinds of iron will speak for themselves.

Professor Kick has given many examples of the appearances presented by the combination of different kinds of iron, and adds: "When in the forging of any piece different qualities of iron are united, the acid, when applied to the prepared surface, chiefly attacks the quality for which it has the most affinity, and to such an extent that its mordant action on the other portions is much less active than if these portions were exposed alone or singly to the action of the acid. Bessemer steel alone, submitted to this action, presents a gray surface, but if it is welded to a coarse-grained iron, it is attacked in a less degree."

As to the results of the action of the acid in relation to the method of working iron, the foregoing remarks show that some light has already been thrown on the choice of different qualities of iron in the arrangement of the piles; they also point out that, even with the most simple piling, there is always a considerable crushing of the bands. It is nevertheless possible to draw from the appearance of the surface acted upon by the acid a conclusion as to the position of the bands or bars occupied in the pile. The more uniform is, or may be, the distribution of the pressure in the pile, the less will individual bands become disarranged. The Professor has come to the conclusion that the best method of forming the piles is that in which the welding is so perfect as to furnish the most satisfactory indications when submitted to the acid test.

In conclusion, Professor Kick admits that the samples on which he conducted his experiments were obtained from only one establishment, and that they were too few to admit of general conclusions being drawn from them; he believes, however, that he has conclusively pointed out the importance of this method of testing irons, as well for the manufacturer as for the consumer.—*La Metallurgie.*

The Iron Trade at Home.

On the 30th of July last, we wrote and printed in the *Bulletin*, the following brief paragraph:

The revival of business in the iron trade which is so generally commented on by the press is only partial and prospective. The improvement in prices is scarcely perceptible, and the increased demand will not start many mills or furnaces not now in operation. Of most kinds of pig iron there is still a large quantity in stock. We make these statements after careful inquiry in many quarters. Undoubtedly trade is looking up, and the worst is over, but it would be well not to augur immediate prosperity from the hopeful signs of the past two weeks. It is far from probable that there will be any general revival of business before September. As yet the price obtained, either for raw or manufactured iron, do not compensate the makers. Money is still lost on pig iron and on bar iron.

The opinions expressed a month ago we see no reasons to modify to-day. There is no general improvement in the iron trade of this country. Here and there is an increased local demand, caused by the giving out of orders which cannot longer be withheld, but the general revival of business in the iron trade, which can only come from the giving out of large orders for railway supplies, and from the re-establishment of confidence and activity in all productive and commercial channels, has not yet taken place. What this month of September and the month of October may bring forth we cannot prognosticate, but the indications are that they will not greatly add to the volume of business. The leading railroads are buying sparingly, and they are not likely to change this policy for one that is less conservative. Their urgent financial necessities, and the certain lack of a large foreign demand for the breadstuffs of the West, which will curtail freights, are the influences that will weigh in favor of the continued exercise of the strictest economy. Railroad tracks are not so much in need of repairs as many believe. Few, very few, new lines of railroad are being built, and the demand from this source for rails and other iron supplies will be exceedingly limited. The *Railroad Gazette* (New York) has reliable information showing the construction up to August 22d of 916 miles of new railroad in 1874, against 2028 miles reported for the same time in 1873, and 3485 miles in the same time in 1872. These figures indicate a remarkable diminution in the demand for railway supplies on account of new roads, and there is no reason to believe that there will be any early increase in the demand from this source. Our abundant harvest will not help the general iron business to any appreciable extent, for the absence of a large foreign demand will depress prices of produce and compel the farmers and those directly dependent upon them to buy all kinds of manufactured goods with the utmost caution. It is clearly a mistake to suppose that a good harvest necessarily helps business; it does not. There may be a surplus of agricultural products, as there has lately been a surplus of iron products, and we all know what that means. Then, too, we have many thousand of unemployed workingmen in every State in the Union, and so long as this is the case general business will suffer, and the iron trade must sympathize with other industries. Still, another unfavorable indication of the immediate future of the iron trade is the plethoric condition of the banks of the country. Money is not in the channels of productive industry, but in strong vaults, where it is earning nothing for the people. So long as money hides itself in city banks, from which it ventures only when tempted by a well secured call loan, there can be no general stimulus to the iron business or to any other business. A speculative mania may have its evils, but it is far preferable to the financial dead-rot we are now having. There are thousands of legitimate, safe, greatly needed enterprises all over the country which are languishing and perishing for the need of the money which timid capitalists charge their bankers to hold on to with a death grip. If even the half of the money which is now lying idle in our banks were employed in building railroads and steamships, opening mines, and otherwise developing the wealth of the country, there would be an immediate revival of prosperity in the iron trade, in the cotton trade, in the woolen trade, and in every trade. But capital is often a coward, and as we have had a panic, which has driven it to its hiding places, we must wait until it chooses to expose itself again to the vicissitudes of speculative enterprise. This it *may* do in September and October, but we do not think that it will.

Frankly, we do not look for much revival in the business of making iron before next spring. What is there to produce it? If the railroads were heavily in the market we would take courage; but they are not, and we can not believe that they are soon going to be. The South is poverty-stricken; the West is not going to be enriched by its large crop of wheat; capital everywhere, from one cause and another declines to embark largely in new enterprises or to prosecute many that are already undertaken. Clearly the iron men must *wait*, and in waiting the winter will come and go. It is no time to put in blast a furnace that is now idle it is no time to pile up bar iron or railroad iron in the hope that there will be an iron hunger throughout the land before Christmas. There won't be. Go slow. It is some comfort to know that prices are at the bottom. If they *could* go lower, the bottom would fall out of everything. Next year will see better times than these, and 1876 still better; but 1874 may be depended upon to maintain the bad reputation with which it began its luckless career.—*Bulletin of the Iron and Steel Association.*

Water Supply of Ancient Cities.

BY LIEUT. MC HARDY,

From the papers of the Royal Engineers.

In ancient times the water was always allowed to flow of its own accord from a high source to the reservoir, along a channel prepared for it, called an aqueduct.

Aqueducts existed at a very early date indeed. Among the first mentioned was one erected by Solomon, to convey water from Bethlehem to Jerusalem. It was similar in construction to much more recent works, the conduit being three feet square, and built of freestone, strongly cemented, and coated one inch thick with plaster. The stones were 15 inches thick.

But the system of aqueducts never reached such perfection as it was carried to in Rome. There vast sums of money were expended on these great public works, and their ruins show that they had been executed in a style of corresponding magnificence.

The first Roman aqueduct was constructed about the year 442 B. C., by the Censor Appius Claudius, whose name it bore. Its total length was about 12 miles.

Another was commenced 40 years after this, which brought the waters of the river Anio to Rome, and the expense of the work was defrayed from the spoils taken in the war with Pyrrhus.

Thus, then, were aqueducts from time to time constructed until, in the time of Nerva, A. D. 96, their number had increased to nine, and before the seat of government was removed from Rome to Constantinople there were about 20 altogether.

The management of these works was intrusted to a public officer, and the position he held was considered very important; indeed, the office of *Præfectus Aquarum* was only bestowed on those of the highest rank, who had served the State well, and distinguished themselves in war.

As the principle observed in the design of the aqueducts were the same for all, it may be well to consider for a short time the mode of their construction.

From the inlet at the source until the water was delivered in Rome, the stream was conducted along a closed channel or specus, having a regular and uniform slope or fall toward the city.

The inclination given by the Romans varied from 1-200 (Vit.) to 1-400, being much greater than that generally allowed at the present time; but this may have been necessary for the better scouring of the specus and for preventing any deposit of mud or silt.

In order to maintain the channel at the proper levels it had sometimes to be raised on an earthen embankment, or carried on a series of arches, and sometimes sunk underground and tunnelled through rock.

Embankment was employed when the culvert was slightly above the level of the ground, but when valleys had to be crossed the channel ran on the top of lines of arches. When the level was very much above that of the ground, a second or third tier of arches was built on the lowest series, and the specus laid on top of all.

Our notions of Roman waterworks are apt to be exclusively associated with these gigantic erections, but they supported only a small portion of the total length of the specus. Thus, we find that in the time of Frontinus, A. D. 96, the total length of all the aqueducts was about 278 miles, and of these 28 only were supported on arches. But by far the largest part of the channels was below the surface of the ground, for of the 278 miles we find that 243 were underground work. However, the vastness of the conception, and the great energy in execution displayed in the construction of these lines of arches, give them deservedly a prominent place in our consideration of Roman aqueducts.

The specus were generally made with rectangular section, or with three sides of a rectangle and an arched roof. They varied in size from 4 feet high by 2 feet wide, to 6 feet high by 4 feet 3 inches wide.

It will be allowed that this section for an aqueduct is not well suited for keeping the channel clear of deposit, but the great velocity at which the water must have flowed would have tended to counteract this.

The specus were built of stone or brick, except when they were tunnelled through rock, in which case a brick lining was considered unnecessary. In order to make the culvert water tight it was coated carefully on the inside with plaster laid on in separate layers. The tunnelled parts of the line seem to have been coated with plaster equally with the parts having the brick lining. The plaster which Pliny declares was found to be the best, was composed of fresh lime slaked with wine, and rubbed with hogs lard and the juice of figs. This was rather a strange composition for a plaster; never likely to be used in this country. However I have made a little of it for an experiment, and find that the plaster is very much inferior, on the whole, to cements made now on a far cheaper plan; but the surface becomes very hard and resists water well.

It is natural to suppose that a large quantity of air would be drawn into these channels by the flow of the water; so, to prevent any serious consequences from the air thus becoming accumulated and compressed in the specus, holes were made which communicated with the open air, and presented a ready escape for the compressed air in the interior. These openings were placed about 130 feet apart along the aqueduct.

When the water had been brought to within about seven miles of Rome, it flowed into a settling pond or piscina. The piscina consisted of a large covered space in which the water might spread out; and thus, having lost its velocity, the mud in suspension would be deposited, and the clear water would enter the continuation of the specus on the other side. The covering consisted of a series of arches, forming long vaults, transverse to the line of the aqueduct. The passages for water from vault to vault, were so arranged as to be in echellon, so that the water was checked as much as possible in its passage through the piscina. In some piscinæ the water passed through four vaults, which were so arranged that two were on a level with the specus, and contiguous, while the other two were immediately under the first two. The water flowed from one on the top into that below it, and from this passed into the other low vault, rising out of it into the one above, when it again entered the specus.

The works were all coated with cement, which remains in many cases intact at the present day.

When the aqueducts approached the gates of Rome great care seems to have been bestowed on the decorative building of arches, especially when crossing any of the main roads.

The specus delivered the water at last into a castellum, or service reservoir, from which proceeded pipes to the public baths, private houses, or public fountains through the town. Some of the pipes emitted water on the spot to those who chose to come for it, and were in fact large public fountains.

The name of the castellum may have been given to these reservoirs from the fact that several similar buildings were erected along the course of the aqueduct, in which resided the soldiers who had to guard the works, and the masons who kept them in repair.

The bulk of the people of Rome carried the water from the public fountains, while the higher class had service pipes laid from the castellum to their own cisterns. The quantity of water allowed was regulated by an officer at the castellum, who, by means of cocks, could stop the supply at pleasure. The pipes in which the water was distributed through the town were made of lead or earthenware. The leaden pipes had a section somewhat oval and pointed on the top. They were not soldered, but simply pressed together, and it is just possible that the old Romans knew that two clear surfaces of lead, when pressed firmly together, unite securely and form a perfect joint.

They certainly had the same dread of the solvent action of soft water on lead which exists at the present day. Vitruvius recommended earthenware pipes on this very ground, because "water conducted through earthen pipes is more wholesome than through lead; indeed," he says, "that conveyed through lead must be injurious to the human system." Their earthenware pipes had generally a diameter of about two inches and were tongued into one another. In order to strengthen the joints, which were sometimes subjected to a pressure of 200 feet, and, therefore, were liable to give way, the Romans enclosed them in an envelope of mortar, made with pounded brick, which set so firmly as to make the joints the strongest parts of the pipe.

One other point let us notice—that the Romans never brought the water to the light until it was to be used; and on this account they must have had it free from animal and vegetable impurities, which so readily appear in water exposed to the sun's rays.

Mechanical Puddling.—Mr. A. Greener, of Brenton Lodge, Darlington, writes to the *Newcastle Daily Chronicle*: "The remarks that appeared in your paper in reference to the reported failure of Danks' process of rotary puddling may be calculated to lead to the erroneous impression that, because Danks' system has so far proved a commercial failure, we shall be compelled again to resort to hand puddling. It is well that this impression should be got rid of; and all who are familiar with the iron trade must be aware that there is no good reason why hand puddling should still be persisted in. At the Round Oak Iron Works, Dudley, and at the Tudhoe, Iron Works, Spennymore, puddling furnaces have been worked for a considerable time past by mechanical means, on what is known as Dormoy's principle. By this method hand labor is almost entirely obviated; and the results obtained up to the present time, and over a period sufficiently lengthy to prove that they can be permanently and regularly depended on, are of the most satisfactory character. Nearly 3000 tons of iron have been produced with Dormoy furnaces at Tudhoe, with a consumption of not more than 14 cwt. of coal per ton of iron made, whereas the average consumption of coal per ton of iron made in the ordinary puddling furnaces is not less than 25 cwt. But this is not all. The Dormoy puddling furnace gives a decidedly better production of iron than the ordinary puddling furnace, and the quality of the iron is considerably improved. With such results as these, it is absurd to talk of returning to the old and expensive system of hand puddling, as the Roane Iron Company have done in America. Mechanical puddling, in one form or another, must become the system of the future."

The attention of such of our readers as may wish to buy a train of rolls for making merchant bar and hoop iron, is invited to the advertisement of W.W. Jones, under our heading of "For sale."

MINERS' CANDLES.

Superior to any other Light for Mining Purposes. Manufactured by

JAMES BOYD'S SONS,

Nos. 10 & 12 Franklin St., N. Y.

Special Notices.

TO INVENTORS.

Patents secured in the United States and Europe, on the lowest terms and very

PROMPTLY,

by **A. V. BRIESEN.** Solicitor of Patents and Attorney at Law in Patent Cases.

258 Broadway, N. Y., cor. Warren St. Consultation gratis.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. **There is a special claim on each of the Dies.** All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**

DEEP RIVER, Conn., Sept. 7, 1874.

Special Notices.

1776. 1876.

INTERNATIONAL EXHIBITION.

Office of the U. S. CENTENNIAL COMMISSION, PHILADELPHIA, Pa.

In accordance with the several Acts of the Congress of the United States, providing for the celebration of the

CENTENNIAL ANNIVERSARY

of American Independence, there will be held in FAIRMOUNT PARK, Philadelphia, in the year 1876, an

INTERNATIONAL EXHIBITION

of Arts, Manufactures, and Products of the Soil and Mine.

The exhibition will be opened on the 19th of April and closed on the 19th of October.

APPLICATION FOR SPACE.

To secure space for exhibits in the buildings or the park, early application should be made. The necessary forms for application, together with the regulations for exhibitors and needed information, will be forwarded on application to the office of the Centennial Commission.

A. T. GOSHORN, Director-General.

J. L. CAMPBELL, Secretary.

The Chilean Exposition.

The New York Commission for this exposition calls especial attention to the fact that articles will be received at Santiago till Aug. 25, 1875, but that applications for space must leave here by Dec. 1st, 1874. In all matters pertaining to railroads and machinery generally, parties desiring more definite information are referred to Mr. W. W. Evans, 63 Pine St., Inspecting Engineer for the government of Chili. In shipping, and our commercial relations with Chili, to the well known merchants Ribon & Munos, 52 Pine St.; Fabbri & Chauncey, 48 South St.; L. del Monte, 52 Exchange Place; C. Carranza, 25 William St., or J. B. Casablanca, 43 Beaver St. In patent and other laws, institutions and general information about Chili, to Mr. A. Villaroel, 52 Pine St., Secretary of this Commission and corresponding agent of Chili, who will furnish blank forms of applications, pamphlets, etc.

STEPHEN ROGERS,

Consul for Chili in New York and President of the Commission.

THE CANADIAN BANK OF COMMERCE.

Capital - - $6,000,000, Gold.

Surplus - $1,800,000, Gold.

The New York Agency, No. 60 Wall Street, buys and sells Sterling Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other Banking Business.

J. G. HARPER, J. H. GOADBY, Agents.

Katahdin Charcoal Pig Iron.

O. W. DAVIS, Jr., Manufacturer, **Portland, Me.**

Furnace in Piscataquis County, Me., for Car Wheels, Steam Cylinders, Boiler Plates, Hydraulic Presses, Plows, Chilled Rolls, and any purpose requiring great strength.

South Boston Tests, Katahdin Pig Iron.

No. 2,	density, 7·2002;	tensile strength	18	square in.,	19,894
No. 3,	" 7·2432;	"	"	"	26,928
No. 4,	" 7·2305;	"	"	"	30,765

Shipped by rail or water from Bangor or Portland. Samples and analyses furnished on application.

THE

McHaffie Direct Steel Castings Co.

STEEL CASTINGS,

Solid and Homogeneous, guaranteed to stand a Tensible Strain of 25 tons per square inch. An invaluable substitute for expensive **WROUGHT IRON FORGINGS** or for Iron Castings, where great strength is required. Office, **cor. Evelina and Levant Sts., PHILADELPHIA.**

Send for Circular and Price List.

ASA SNYDER,

Scotch and Anthracite Pig Irons.

Also Furnace Agent and Dealer in the following brands of

Cold Blast Charcoal Pig Iron.

Stonewall, Rehoboth, Derr, Callie, Ravenscliff, Cedar Run, Wythe, Eagle, Greenville, Walton, &c. Office and Yard,

1008, 1010, 1012 & 1014 Cary St., RICHMOND, VA.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at ***99 Cannon Street, London, E. C.***

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Wanted Situation.

A young man 24 years of age, desires a situation in the Hardware business. Has had five years' experience in General Hardware, and can give the best of references as to character and capability. Address,

DUDLEY W. SMITH, Wooster, O.

Wanted.

A situation as superintendent of a rolling mill, by a man who has a practical knowledge of Merchant, Guide and Hoop Rolling, also of puddling. Understands Roll Turning, Mill Building and Repairing. Good reference given. Address

ALFRED COE,

219 Northampton St., Easton, Pa.

Wanted.---Situation.

A young man, 24 years of age, desires a situation in the Hardware Business. Has had five years' experience in general hardware, and can give the best of references as to character and capacity. Address

DUDLEY W. SMITH, Wooster, O.

NOTICE.

I will sell at auction and private sale the entire stock of Hardware belonging to John S. Prouty, in lots to suit customers.

Auction days Tuesdays and Thursdays, and all other times at private sale (quoting auction prices) until the whole is disposed of. Terms liberal.

JNO. H. WILLIAMS.

Wanted.

A situation as bookkeeper or cashier of an iron works, a hardware business, or in the coal trade, which the advertiser understands in all its branches. Highest references of character, capacity, &c.

Address, **H. D.,**

Office of ***The Iron Age,*** 10 Warren St., N. Y.

Special Notices.

Wanted,

the management and manufacture in England of American Inventions that have been introduced in America, and are patented in England. Machinist and Engineering tools preferred. Address,

WM. HORSFALL,

123 Atlantic Ave., Brooklyn, N. Y.

Wanted a Partner.

A partner wanted, thoroughly posted in Hardware, with from $3000 to $4000 capital, to engage with the advertiser in purchasing a business of 25 years' standing. Apply by letter or in person at

Clairmont Savings Bank,

247 Greenwich St., N. Y.

Blast Furnaces.

WANTED.—A situation by a competent, experienced Furnace Manager, either in locating or erecting furnaces, or taking full charge of those already erected. Has had experience in coke and anthracite coal. Has planned and erected the largest class of works and put them in successful operation. Has best references. Salary in accordance with the times. Address **X. L.,**

Office of ***THE IRON AGE,*** 10 Warren St., N. Y.

Wanted,

By an Analytical Chemist of some experience, (has had charge of the Laboratories of Lafayette College for several years) a situation in Metallurgical or Chemical works. Good references.

CHARLES McINTIRE, Jr.,

1136 Washington St., Easton, Pa.

WM. E. TANNER & CO.,

Metropolitan Works.

Manufacturers of

Steam Engines, Boilers and other MACHINERY,

Canal St., from 6th to 7th, Richmond, Va.

In addition to a full line of new engines, boilers, saw mills, and other machinery of our own manufacture, we have now on hand and will sell at very moderate rates, the following lot of **second-hand machinery**, viz.: 3 Double Hoisting Engines, suitable for mining, tunnelling or other purposes. Each of these engines has two cylinders, 7½ in. diam. by 18 in. stroke; two drums, 4 ft. diam. by 4 ft. long; geared to engine in proportion of 8 to 1, and are provided with disconnecting gear and friction brakes.

One 150 Horse-Power Stationary Engine, with heavy fly wheel, all complete, and nearly as good as new.

Three Return Tubular Boilers, (70 three inch tubes each), 15 feet long, complete with steam drum, fronts, valves, grates, &c., suitable for the above engine.

One 10 Horse-Power Portable Engine of our own make, complete, with two driving pulleys, "Judson" governor, &c., nearly new, and in excellent order.

One 30 Horse-Power Portable Engine, with circular saw mill, saw and belt complete, in first rate order.

Three 4 Horse-Power Stationary Engines. Cylinder, 4 in. by 10 in.

One 30 Horse-Power Stationary Engine, as good as new, complete, with "Judson" governor, fly wheel, &c.

One 30 Horse-Power Stationary Engine, in good running order, but not as new as the above.

One 16 Horse-Power Stationary Engine, with new vertica lboiler.

One Otis Hoisting Engine, in good order.

Two Flue Boilers, 26 ft. long, 42 in. diam., each with two 14 in. flues, iron front, grates, &c., in good order.

One Flue Boiler, 34 ft. long, 40 in. diam. with two 14 in. flues, about as good as new.

One 7 Horse Portable Engine, of our own make, used only a few months, and in perfect order.

Two No. 6 Sturtevant Blowers. Two No. 4 McKenzie Blowers. One No. 6 Andrew's Centrifugal Pump. One No. 6 Turbinate Centrifugal Pump. Three No. 0 Cameron Pumps. One No. 2 Cameron Pump. One Knowle's Pump. One Earle Pump.

Thirty Brass Tubes, 1¼ diam., 12¼ ft. long.

Send for illustrated catalogue and Price Lists.

THE

Fletcherville Blast Furnace Co.,

Manufacture

CHARCOAL PIG IRON,

Exclusively from New Bed Pure Magnetic Ore, suitable for Bessemer, Malleable and Car Wheel purposes, or for foundry use where very soft and strong iron is required.

Analysis of Average New Bed Pure Ore.		*Analysis of No. 1 Bessemer Pig.*	
Metallic iron	68·240	Undetermined matter and loss	·134
Oxygen with iron	26·010	Silicon	1·019
Water	·380	Carbon	3·821
Insoluble silicous matter	4·320	Phosphorus	·048
Sulphur, practically none		Sulphur, practically none	
Phosphorus	·038	Calcium	·140
Alumina	·280	Metallic iron	94·838
Lime	·140		100·000
Undetermined matter and loss	·592		
	100·000		

Witherbees & Fletcher,

Port Henry, Essex Co., N. Y.

Furnace at FLETCHERVILLE, near Mineville, N. Y.

AMERICAN IRON TRADE MANUAL,

THOMAS DUNLAP, Editor.

NOW READY.

Wiley's American Iron Trade Manual

Of the leading Iron Industries of the United States. This work includes a description of each ***Blast Furnace, Rolling Mill, Bessemer Steel, Crucible Steel, Car*** and ***Car Wheel, Locomotive, Stove, Iron Bridge, Iron Pipe*** and ***Iron Ship Works*** in the country, with location, character of produce, and capacity of each; the whole arranged by States. Also, a ***Complete Directory*** of the ***Steam Engine*** and ***Machinery Works, Tool*** and ***Hardware Works*** and ***Iron Foundries,*** and a ***Treatise*** on the ***Iron Ore Regions*** of the country, giving locality, extent of deposit, character of ore by chemical analysis, and commercial value of same, with a ***Full Index.***

It forms a 4to volume of over 750 pages, is illustrated with many wood engravings, and handsomely bound in full cloth. Price, $7·50 per copy.

This work supplies a vacancy in iron trade literature, and a very large demand is anticipated for it—as large as the information furnished is valuable.

It will ***not*** be sold through the trade, but only by subscription. Copies will be sent free by express to any part of the United States on the receipt of the price as above, either by our agents or ourselves.

JOHN WILEY & SON,

15 Astor Place, N. Y.

EUGENE BISSELL, AUCTIONEER.

By BISSELL & CO.,

Successors to R. T. HAZELL & Co.,

Store No. 94 Reade Street.

Our REGULAR SALES of HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season.

CASH ADVANCES made on CONSIGNMENTS without additional charge.

A. PURVES & SON,

Corner South & Penn Streets, Phila.,

Dealers in

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.

Cash paid for allkinds of **Metals** and **Tools.**

Special Notices.

To Quit Business.

Will sell the best appointed Hardware Store Building in the State of Ohio, with or without stock. Doing a very large and satisfactory trade. No bonus for the trade. Parties purchasing will have a good and satisfactory business from the opening. Property rents at good prices.

For particulars inquire of

JOHN E. BYRNE,

99 Chambers St., N. Y.

JAMES C. JACOBS, Wooster, Ohio.

J. M. WHITE,

Architect and Constructor of Charcoal Blast Furnaces. Plans, Specifications and Estimates of construction furnished upon application.

Office address,

FON DU LAC, WIS.

For Sale, &c.

FOR SALE.

An 8¼ inch mill train for making Merchant, Band and Hoop Iron. Will be sold cheap.

Apply to **W. W. JONES,**

Near the Lehigh Valley Railroad Depot,

Allentown, Pa.

To Rent.

First and third floors—together or separate. Brick building 125x50, well lighted and the best business location in the city. Light power will be supplied if desired, or parties can furnish their own if preferred. Address, with particulars,

H. D. STANLEY, Secretary,

Bridgeport, Conn.

FOR SALE.—AN UNFINISHED IRON, TWIN SCREW STEAM VESSEL, having double bottom and water-tight compartments.

Length between Perpendiculars	390 feet.
Breadth of Beam	45 "
Depth to Main Deck	21½ "
Displacement at 22 feet draught	6,000 tons.
Area of Midship Section	893 sq. ft.
Number of Transverse Bulkheads	7
ENGINES.	
Two pairs, each driving one screw.	
Diameter of Steam Cylinder	72 inches.
Stroke of Piston	45 "
Surface Condensers, area	12,560 sq. ft.
SCREWS.	
Diameter	18 feet.
Pitch	27 "
Number of Blades	3
BOILERS.	
Ten in number; ordinary Horizontal Fire Tubular Type.	
Total Heating surface	28,000 sq. ft.
Grate Surface	873 "

This vessel was intended to be completed for the State of New Jersey as an Ironclad. The plans were prepared and the work was carried on under the direction of Gen. GEORGE B. MCCLELLAN, U. S. A. All materials and the workmanship are guaranteed to be of the best possible description.

The funds appropriated for the purpose of completing the vessel not proving sufficient, the Legislature of the State of New Jersey has directed that a sale be made to the highest bidder. A Commission, consisting of

His Excellency, Gov. JOEL PARKER, of Trenton,

Vice-Chancellor ANZI DODD, of Newark,

Honorable Messrs. W. W. SHIPPIN and S. B. DOD, of Hoboken,

has been appointed to effect such sale.

Bids endorsed "PROPOSALS FOR THE PURCHASE OF IRON STEAMER, OR OF PARTS THEREOF," may be addressed to the Governor of the State of New Jersey, by whom they will be received at Trenton, N. J., until 12 o'clock, M., on the second day of November next, at which time they will be publicly opened.

Blanks for proposals, and a pamphlet containing a detailed description of the vessel, as nearly completed, except as to armor and armament, may be obtained by addressing either member of the Commission or the undersigned.

Permission to examine the vessel, and to inspect the premises, may be obtained (by intending purchasers) on application at the Dry Dock, where the ship now lies, or to the Consulting Engineer to the Commission, who will be prepared to exhibit drawings, to explain the structure of hull and machinery, and to give any other information respecting the vessel.

R. H. THURSTON,

Consulting Engineer to the Commission, Hoboken, New Jersey, United States of America

FOR SALE.

At Lowest Manufacturers' Rates,

GUNS & SHEET ZINC,

Best German and Belgian Brands,

By ***LOUIS WINDMULLER & ROELKER,***

20 Reade Street, N. Y.

FOR SALE,

£1. German consular instructions in English, published by subscriber, who *translates* from and into the English, Spanish, French and German. Latest *translations* made for the Spanish Government, Pacific Mail Steamship Co., Walter A. Wood, Morris, Wheeler & Co., Todd & Rafferty, and John T. Dunkin, N. Y.; Wilder & Co., Savannah; and the Tanite Co., Stroudsburg; by

C. KIRCHHOFF,

Commercial Editor "El Cronista,"

Box 2806, N. Y.

IRON FOR SALE.

Manufactured by the

ULSTER BLAST FURNACE,

NAPANOCH, N. Y.

Samples and prices with,

M. M. PILLSBURY, 85 John St., N. Y.

Valuable Iron Works For Sale.

The undersigned offers for sale the Iron Works in Pottsville, Schuylkill County, Pa., known as "The Washington Works," consisting of a

Large Stone Machine Shop & Foundry,

Brick Pattern House, Erecting Shop, Stone Blacksmith Shop, Brick Office, and Lot of Ground containing in front 195 feet 3 inches, and in depth 260 feet.

There will be sold with the above a large and valuable collection of Patterns, Heavy Crane Flasks and Heavy Core Spindles for making heavy Castings and Pipes of all sizes; Turning and Planing Tools.

The Works can be put in immediate operation. A favorable opportunity is here presented for enterprising men. The demand for Castings and Machinery is constantly increasing in this region. The property will be sold on liberal terms. ***If not sold in a reasonable time it will be for Rent.***

For particulars apply to

J. W. ROSEBERRY, Trustee,

Pottsville, Pa.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Sept. 9, 1874.

Since our last review of the financial markets there has been a decided improvement in the tone of business in Wall street, and everything gives indication of renewed confidence. Money continues easy at 2 @ 3 per cent. on call. Prime short date commercial paper is freely discounted at 5 @ 6 per cent., and long date at 6¼ @ 7½ per cent. The money market already shows signs of hardening, however, and an advance in discount rates may be looked for.

The gold market has been barely steady, with a good borrowing demand for cash coin. On Thursday $1,000,000 was sold by the Treasury at 109·77, and the supply in the market has been further increased by disbursements to the amount of $2,761,000. The following shows the daily range of the premium:

	Highest.	Lowest.
Thursday	110	109¾
Friday	109¾	109¾
Saturday	109⅞	109¾
Monday	109¾	109¾
Tuesday	109¾	109¾
Wednesday	109¾	109¾

The stock market has gained new strength since last week, and nearly all the leading stocks have advanced. The principal dealings were in Union Pacific, Western Union, Lake Shore, Wabash, Erie and Pacific Mail.

Government bonds have been steady here and abroad. State bonds are dull, but railway mortgages have developed unexpected strength, Union Pacific sinking funds being especially in demand, owing to the fact that the holders of Incomes are largely converting them into the former.

The following tables show the movements in foreign trade for the week:

IMPORTS.

	1872.	1873.	1874.
Total for week..	$8,969,052	$7,797,337	$6,771,208
Prev. reported...	300,065,307	276,061,520	275,042,848
Since Jan. 1....	$309,034,359	$283,858,757	$281,814,056

Included in the imports of general merchandise for the week are:

	Quant.	Value.
Anvils	230	$2,429
Brass goods	7	793
Bronzes	68	10,897
Chains and anchors	145	6,847
Copper	...	73
Cutlery	148	74,207
Guns	101	12,620
Hardware	66	6,168
Iron pig, tons	300	8,899
Iron sheet, tons	81	24,417
Railroad bars	11,533	195,630
Iron, other tons	332	13,260
Lead pigs	1,928	13,700
Metal goods	354	21,269
Nails	23	744
Needles	10	2,478
Old metal	...	2,260
Platina	1	3,668
Plated ware	2	108
Per. caps	11	1,158
Saddlery	10	1,637
Steel	2,662	23,861
Speiter, lbs	110,000	5,357
Silverware	3	378
Tin, boxes	19,099	152,189
Tin, bbls	10	954
Tin, 264 slabs, 21,331 lbs	...	4,162
Wire	419	7,360

EXPORTS EXCLUSIVE OF SPECIE.

	1872.	1873.	1874.
For the week...	$4,406,670	$5,556,354	$5,907,988
Prev. reported...	147,186,885	190,229,227	197,859,492
Since Jan 1....	$151,593,555	$195,785,581	$203,767,490

EXPORTS OF SPECIE.

Total for the week	$472,244
Previously reported	40,244,927
Total since January 1, 1874	$40,717,171
Same time in 1873	39,914,762
Same time in 1872	56,542,170

The bank statement shows an increase in loans of $765,100, which is a gratifying change, a small increase in specie, and unimportant changes otherwise, except in legal tenders, which have fallen $1,677,900. The total reserve, by reason of the decrease in legal tenders, is lown $1,424,700. The banks now hold a total reserve in lawful money of $84,496,000, and the law requires $58,686,500; so that they have an excess of $25,809,500, or $1,361,175 less than last week. The figures are as follows:

	Aug. 29.	Sept. 5.	Differences.
Loans	$278,319,800	$279,084,900	Inc. $765,100
Specie	18,638,100	18,891,300	Inc. 253,200
Leg. Ten.	67,282,600	65,604,700	Dec. 1,677,900
Deposits	235,000,100	234,746,000	Dec. 254,100
Circulation	25,803,300	25,662,400	Dec. 140,900

Government bonds closed as follows:

	Bid.	Asked.
U. S. Currency 6's	117½	117¾
U. S. 6s 1881, reg	117½	117¾
U. S. 6s. 1881, cou	118¼	118½
U. S. 1862, 5-20 reg	112¼	112½
U. S. 5-20 1862, cou	112¾	113¼
U. S. 5-20 1864, reg	114¼	114½
U. S. 5-20 1864, con	115¾	116
U. S. 5-20 1865, reg	115¾	115¾
U. S. 5-20 1865, con	116¾	117
U. S. 5-20 1865, reg. new	115¾	115¾
U. S. 5-20 1865, cou	116¼	116¾
U. S. 5-20 1867, reg	116¼	116¾
U. S. 5-20 1867, con	117¼	117¾
U. S. 5-20 1868, reg	116¾	117
U. S. 5-20 1868, cou	117¾	117¾
U. S. 10-40 reg	110¾	111
U. S. 10-40 cou	111¼	111¾
U. S. 5s. 1881, reg	112¾	113¼
U. S. 6s. 1881, cou	112¾	113¼

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	104¾	104
Lake Shore	75¾	74¾
Rock Island	101¾	100¾
Del. Lack. and Western	108¾	108¾
Wabash	33	31¾
Harlem	126¾	126¾
Western Union Telegraph	79¾	79
Atlantic and Pacific Telegraph	16¾	16¾
Northwestern	37¾	37
Milwaukee & St. Paul	34	33¾
Panama	111¾	111¾
Pacific Mail	49¾	48¾
Erie	34¾	34¾
Ohio & Mississippi	24¾	24¾
Boston, Hartford & Erie	1	1
Union Pacific	30¼	30¼
C. C. & Ind. Central	9	8¾
At. & Pa. prf	12¾	12
Quicksilver	31¾	31¾
Do. Preferred	36¾	36¾
Consolidated Coal	47	47

GENERAL HARDWARE.

Trade continues to go on quietly and without noticeable feature. Orders are still made with care, and all departments of the trade are now getting their share of them. A cut in Apple Parers has taken place in Philadelphia, and prices here are rather unsettled. Philadelphia quotations will be found in the usual column.

Trade in Foreign Hardware continues reasonably active, but orders are still light and carefully restricted to the immediate wants of buyers. No changes in price have been reported during the week, either here or abroad.

The Nail market remains very much as at our last writing. The protracted stoppage of some mills, and the lessened production of others, have made Nails rather scarce, and the market is quite as firm in its tone as it was at the time of our last report. 10d. are nominally $3·75, but small orders are easily placed at $3·70, and large orders could be placed at a less price. We have received the following special dispatch from Pittsburgh:

PITTSBURGH, Sept. 9, 1874.

To the Editor of The Iron Age.—At a meeting of Nail manufacturers yesterday, a card of rates was agreed upon, with $3·35, sixty days, as a basis for 10d. with a discount of two per cent. for cash. The reduction of 12½ cents per keg for hundred keg lots or over to be discontinued. The price delivered in Chicago and St. Louis have been fixed at $3·75; in Cleveland, $3·60; and in Cincinnati, $3·45.

P. & F. Corbin have issued under date of September 1st, Price Book No. 2, referring to their illustrated and descriptive catalogue of 1874. These new prices make their goods as cheap as any others. The following circular accompanies the price book:

September, 1874

Gent: We send you herewith our price book No. 2, dated Sept. 1, 1874.

In consequence of the *apparent insanity* of some of our competitors, in reducing prices in the middle of the season, without any visible reason, we are obliged to make quite a reduction in price of most of our miscellaneous goods, changing in some cases the long prices, and in others the discounts. The change is so general and sweeping in its character, we do not designate the same by printing it in "heavy faced type." Hoping to be favored with a continuance of your trade, we are,

Yours, very truly, P. & F. CORBIN.

P. S.—We would call attention to a recent decision of the Commissioner of Patents establishing the validity of our claim on Store Door Handles and Escutcheons combined (Patent dated March 13th, 1873). The trade are cautioned against purchasing these goods of any other maker than ourselves, as we shall prosecute all infringements. P. & F. C.

Buck Brothers, the well known Chisel manufacturers of Millbury, Mass., inform us that they have, after repeated solicitations, commenced the manufacture of Plane Irons—double and single—which they intend to make superior in style and finish to anything ever made here, and of a quality which they warrant equal to the best imported. Their rates will be English list $5·50 to the £, the same as their Shank Chisels. The irons will be put up in green paper boxes, cut irons one dozen and double irons half dozen in a box. They say "all we ask of our friends is a trial."

Stanley Works have issued the following discount sheet, dated Sept. 1st. All the changes are reductions, and the articles in which they occur are indicated by stars;

	Bronzed Capped Butts	dis 45 %
	" Loose Joint Butts, with Acorns	10 %
	" " " no Acorns	15 %
	" Narrow Butts, &c	15 %
	" L't Inside Blind Butts	15 %
*	" Parliament Butts	15 %
	" Barrel Bolts	30 %
	" Flush "	20 %
	Bronzing Screws	20 %
	Bolts, Chain	40 %
	" B. K. Shutter	40 %
*	" Cottage, Cast	70 %
	" Hotel Chamber	35 %
*	" Wrought Barrel, B. K., new list	50, 10&10 %
*	" " " T. K., "	50, 10&10 %
*	" " " P. K., "	50, 10&10 %
*	" " " B. K., Light, new list	50, 10&10 %
	" Wrought Brass Barrel	35 %
	" " Tinned Bolts	35 %
	" " Barrel, Brass Plated	35 %
	" Canada, Por. and Min. Jap'd	45&5 %
	" " " " Plated	50&5 %
	" Wrought Flat (Steel Spring)	30 %
	" " Flat Tail	20 %
*	" Flush (Sunk and Projecting)	15&10 %
*	" " (Sunk)	15&10 %
*	" B. K. Flush (Common)	30&10 %
*	" " " (Extra Heavy)	30&10 %
*	" " "	30&10 %
*	" Plated K. and Slide Flush	10&10 %
*	" Bronzed K and "	10&10 %
*	" Plated K and "	10&10 %
*	" B. K. Wrought Shutter	35 %
*	" Wro't Shutter, "Stanley's"	50 %
*	" " "Wm. Parker"	50&5 %
	" Cased Shutter	15 %
*	" Shutter, T. K. Lock	15&10 %
*	" " Tinned Knob	15&10 %
	" Wrought Shutter, Galvanized	30 %
	" Southern Door	20 %
*	" Wro't Square Sp'ng, new list	50, 10&10 %
*	" " Store Door, new list	50, 10&10 %
*	" " Square and Round Neck	35 %
	" " Tower	30 %
	Butts, Back Flaps	30 %
	" Inside Blind	30 %
	" Table	30 %
	" Narrow	30 %
	" Chest	30 %
	" Pew Door	30 %
	" Broad	35 %
	" Loose Joint	35 %
	" Reversible, our list	12½ %
	" " Japanned	12½ %
	" Light Inside Blind, "Stanley's"	30 %
	" " " "New Britain"	40 %
	" " " Jap'd, "Stanley's"	20 %
	" Light Narrow, list of Narrow	30 %
	" " Jap'd, "Stanley's"	30 %
	" Car, with Acorns	40 %
	" with Acorns and Fric. Roller	40 %
	" Loose Joint, with Japanned, Bronzed or Silvered Acorns	40&5 %
	" Loose Joint, "	40&5 %
	" Jap'd Loose J't, without Acorns	net
*	" Parliament	10&10 %
*	Corner Irons	50 %
*	Hammers, Carpet	20 %
*	Handles, Flush Chest and Drawer	40&10 %
*	" Wro't Chest, "Stanley W'ks"	add 15 %
*	" Wro't Chest, "Austin Beebe"	add 10 %
	" Lifting and Coffin	50 %
	" Window Shutter	20 %
	Hasps and Staples, Wrought	20&5 %
	" Hooks and Staples, Wrought	20&5 %
*	Staples, Wrought, Hand Forged	20&5 %
	Hinges, H'vy & Ex. H'vy T. "Hart's Pat."	20&10 %
	" Strap and T., new list	20&10 %
	" Long Chest	20&10 %
	" Hasps, Common Staple	20&10 %
	Crate Hasps, Pat. Swivel Staples	20&10 %
	Hinges, Bulk Shutter and Flask	add 40 %
	" Norwich Blind	net
	" Plate and Raised Blind	net
*	" Rolled Plate and Raised	15 %
	Jap'd Screws, American Screw Co.'s new list	40 %
	Knobs, Canada Sash	25 %
	Staples, Floor, Bolt and Lock	45 %
	Steamboat Shutter Fasts	add 40 %
	Step Ladder Joints	net
*	Washers, Wro't Iron. Our list. (See Supplement.) Discount 6 cents per pound.	

Pugsley & Chapman have issued a circular of their goods, which contains some important changes. The list price of Trucks is reduced, and the discount is increased to 30 per cent. The following is the new list:

Store and Cotton Trucks.

	Not Strapped Up.	Strapped Up.
No. 1, 7 in. Wheel	$6·00 each.	$8·00 each.
No. 2, 8 in. "	7·00 "	9·00 "
No. 3, 9 in. "	8·00 "	10·00 "
No. 4, 10 in. "	9·00 "	11·00 "
No. 5, 12 in. "	11·00 "	13·00 "
No. 6, 14 in. "	13·00 "	15·00 "

Cotton Trucks—Same price as Store Trucks.
Barrel Trucks—With bent Iron Slats, $3 advance on store.

Wagon Truck, $12.

This is made either with a plain top or with slats running lengthwise, bolted on the top. It is used for heavy, small boxes, such as tin, sheet iron, or other metals, and for fish, bags of coffee, salt, etc.

Block Truck, $6.

This is a heavy skeleton frame, on low wheels and without a handle. It is used for transporting to short distances, cases of steel, &c., and all packages too heavy to be lifted far above the floor.

They have a very excellent and complete line of Wheel Barrows, of which they carry a large stock, the discount on which is now 25 per cent., which makes Canal Barrows net $1·54½ each when packed, and $1·66⅔ when ready for use. We quote from their circular:

"The advantages of ordering packed are obvious. There is a great saving in freight, less room required for their storage, and they present a more saleable appearance when recently 'set up,' which is a trivial job, as the parts are intended to fit together with very little labor. We have testimonial letters from customers certifying to the satisfactory quality of our goods, and we intend to use our best endeavors to furnish a good article, and at figures that will compete with any other manufacturer. We take especial pains to secure a low freight for our patrons, and being heavily stocked, can ship at short notice."

Their circular also gives the list of "Culindo" Locks (discount now 30 per cent.), and some other goods.

The list prices of Blake's Traps have been reduced to the following, the discount remaining 25 per cent:

No. 0, House Rat Trap, single spring	per doz. $2·50
No. 1, House or Muskrat Trap, single spring	" 2·75
No. 2, Muskrat or Mink Trap, single spring	" 3·00
No. 2½, Mink Trap, Heavy Jaws, single spring	" 3·25
No. 2½, Muskrat or Mink Trap, double spring	" 5·00
No. 3, Fox Trap, double spring	" 7·00
No. 4, Woodchuck or Farmer's Trap, double spring	" 8·00
No. 5, Otter or Beaver Trap, double spring	" 9·00
Chains for Nos. 0, 1, 2, 2¼, 2½	" 1·25
" " Nos. 3, 4, 5	" 1·50

The Enterprise Mfg. Co. have issued the following circular. We are glad to see that their resumption of operations has been even more prompt than we supposed:

PHILADELPHIA, Sept. 4, 1874.

DEAR SIR: We are pleased to state that we have almost entirely recovered from the disastrous effects of the recent fire which threatened the total destruction of our works, and with increased facilities and renewed vigor we are actively engaged in the manufacture of our various lines of goods, and expect in the course of two or three weeks to be able to satisfy the constantly increasing demand of the trade. We would suggest to those of our customers, anticipating purchasing our goods, to favor us with their orders in time to facilitate early shipment. Yours, truly,

ENTERPRISE MFG. CO. OF PA.

The following are the list prices of the Stamped Corrugated Sheet Iron Bottom Riveted Coal Hods made by Smith, Burns & Co., of this city. From these prices a discount of from 15 to 25 per cent. is taken:

	14	15	16	17	18 inch.
Japanned	$6·00	6·25	6·75	7·50	8·00 per doz.
Galvanized	9·50	10·00	10·75	11·50	12·50 "

Morning Glory Funnel Hods.

	No. 15	16	17
Japanned	$9·00	10·50	12·00 per doz.
Galvanized	13·00	14·50	16·00 "

Sidney Shepard & Co., Buffalo, N. Y., have just issued the following reduced price list of Coal Hods, the regular discount from which is 10 per cent. They also report a large demand for Brooks' Patent Stove Boards, which they continue to quote at discount 30 per cent Geo. B. Walbridge, No. 99 Chambers street, is the agent for these goods in this city.

REDUCED PRICE LIST OF COAL HODS.

Sizes	14	15	16	17 inch.
Plain Black	$4·50	$5·00	$5·50	$6·00 dozen.
Bronzed Band	5·00	5·50	6·00	6·75 "
Galvanized	....	7·75	8·50	9·50 "

Sizes	18	19	20 inch.
Plain Black	$6·75	$7·50	$8·50 dozen.
Bronzed Band	7·75	8·50	9·50 "
Galvanized	10·50	11·50	13·00 "

Funnel.

Sizes	15	16	17	18 incb.
Plain Black	$6·50	$7·00	$8·00	$9·00 dozen.
Bronzed Band	7·25	7·75	9·00	10·00 "
Fancy	7·75	8·25	9·50	10·50 "
Galvanized	10·00	11·00	12·00	13·00 "

Helmet.

Sizes	16	17	18 inch.
Bronzed Band	$11·00	$12·00	$13·00 dozen.
Fancy	12·00	13·00	14·00 "

The following are the list prices of the Coal Hods made by the East River Mfg. Co., of this city, with the discounts given on them by jobbers:

Ladies' Favorite Coal Hods.

Japanned.

15 inches	per dozen, $15·00
16 "	" 16·00
17 "	" 18·00
18 "	" 20·00

50 per cent. discount.

Galvanized.

15 inches	per dozen, $19·00
16 "	" 20·00
17 "	" 22·00
18 "	" 25·00

45 per cent. discount.

Patent Corrugated Bottom Coal Hods.

Japanned.

Size, 14 inches	per dozen, $12·00
" 15 "	" 12·75
" 16 "	" 13·50
" 17 "	" 15·50
" 18 "	" 18·00

55 per cent. discount.

Galvanized.

Size, 14 inches	per dozen, $15·00
" 15 "	" 16·00
" 16 "	" 17·50
" 17 "	" 19·50
" 18 "	" 22·50

45 per cent. discount.

Patent "Oriental" Funnel Coal Hods.

Japanned.

No. 15, length 18 inches	per dozen, $16·50
" 16, " 20 "	" 18·00
" 17, " 21 "	" 20·00

50 per cent. discount.

Galvanized.

No. 15, length 18 inches	per dozen, $21·50
" 16, " 20 "	" 22·50
" 17, " 21 "	" 24·00

40 per cent. discount.

G. B. Walbridge informs us that he has on hand a good stock of Washoe Railroad Picks No. 3. As these goods are very scarce, this fact is of interest to the trade.

We have received a circular of Brendlinger & Co., of the Colebrookdale Iron Works, announcing that they have made Biddle Hardware Co., of Philadelphia, their agents, who will carry a full stock of their Sad Irons, Wagon Boxes, etc.

It is a generally admitted fact that Americans have too few holidays, and work too long hours. This applies with peculiar force to those doing business in New York and other large cities, who have very generally to travel a long distance between their homes and places of business. We are therefore glad to be able to announce that since our last a movement has been begun and carried to an unexpectedly successful issue, to close the wholesale hardware houses of this city at 3 o'clock on Saturday afternoons all the year round, as has for a long time been the custom during the summer months. The following article has been signed by the firms whose names are appended, being a large majority of the trade:

"We, the undersigned, do hereby agree to close our respective places of business at 3 o'clock p. m. on Saturdays, throughout the year, provided the same can be made general in the trade."

Hermann Boker & Co.
P. & F. Corbin.
Stanley Works.
King, Briggs & Co.
Blake & Fessenden.
John J. Tower.
Fernald & Sise.
Old Colony Rivet Works.
Union Nut Company.
S. Otis Livingston.
Horace Durrie & Co.
Peck, Stow & Wilcox Co.
Ætna Nut Company.
F. Wiebusch.
Brown Bros.
John I. Brower & Son.
Norwalk Lock Company.
Hilger & Sons.
Graham & Haines.
Louderback, Gilbert & Co.
Providence Tool Company.
Waterbury Brass Company.
Union Hardware Company.
Holmes, Booth & Haydens.
Wm. A. Dodge.
Stauffer, McCready & Co.
Nathan Weed.
A. Field & Sons.
T. F. Cherritree & Co.
Hubbard & Curtis Mfg. Co.
Edward J. Holden & Co.
Wallace & Sons.
Schweitzer Mfg. Co.
Meriden Cutlery Company.
Russell & Erwin Mfg. Co.
Ausable Horse Nail Company.
Landers, Frary & Clark.
Humason & Beckley Mfg. Co.
Union Mfg. Co.
J. Clark Wilson & Co.
Hyatt & Spencer.
Walsh, Coulter & Flagler.
Mulford & Underwood.
Quackenbush, Townsend & Co.
Dunbar, Hobart & Whidden.
G. R. Brewster & Son.
Rowe & Post.
Edward Miller & Co.
Alfred Field & Co.
Turner, Seymour & Judd Mfg. Co.
Stanley Rule & Level Co.
Plume & Atwood Mfg. Co.
Charles Peace.
Beaver Falls Cutlery Co.
Lmforth, Kellogg & Co.
Jacobus & Nimick Mfg. Co.
George B. Walbridge.
Charles Parker.
George W. Alburtus.
Jos. H. Adams & Son.
John Russell Cutlery Co.
Henry Seymour & Co.
Heaton & Denckla.
Robert Friedrichs & Co.

The success of this movement is in a great measure due to the efforts of S. C. Anderson and Nelson Steele.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, Sept. 9, 1874.

Scotch Pig.—During the week the market has fluctuated. It is now strong, with a large business doing. The following are makers' prices:

Gartsherrie No. 1	110/
Coltness No. 1	107/6
Glengarnock No. 1	97/
Eglinton No. 1	87/6

Manufactured Iron.—A large business is doing, but prices are weak. Best Staffordshire Bars are quoted £10. 10/ @ £11. 10/.

Rails.—The market is active, with a large demand and steady prices. Welsh are quoted £7. 10/ to £7. 15/.

IRON.

American Pig.—The appearance of the market is no more cheering than at our last writing, and there are no indications of improvement. We note the sale of 600 tons hypothecated Poughkeepsie Iron, in the hands of bankers, at a private price, but known to be low. This almost clears up the hypothecated Pig Iron on the market. We note the sale of 1000 tons Nos. 1 and 2 Foundry at $28 and $30. From Albany and Troy we hear of decreased production among the Stove manufacturers, and the prospect of an earlier cessation of work than usual. We quote Foundry No. 1, $30 @ $31; Foundry No. 2, $28 @ $29; Gray Forge, $25 @ $28. Gray Forge is in small stock and is firmer than any other grade.

Scotch Pig.—The market is well maintained, as the smallness of the stocks enables holders to get good prices for such Iron as they sell. Eglinton is selling in small lots at $34·50 @ $35, and Glengarnock at $36·50 @ $37. We note the sale of 300 tons hypothecated Eglinton to a dealer, on private terms.

Bar.—The market continues as last reported. We still quote 3 cents as the price for Eastern mills.

Rails.—We hear of no new transactions, and continue to quote, as cash prices, $55, currency, for American, and $48 @ $50, gold, for Welsh.

Old Rails.—We note the sale of 800 tons at $33·50. Since this sale was made we have heard of Rails offered at $33. We quote $33 @ $34.

Scrap.—In the absence of transactions we continue to quote Wrought Scrap $35 @ $37.

The following are BIGELOW & JOHNSTON'S prices current and remarks, under date of Aug. 31, 1874:

NEW RAILS.—In *Foreign* there have again been some sales in bond at prices below what they can be imported for, but the stock on hand is still very heavy, and although a large portion of it is tied up by litigation, yet it must ultimately come on the market, and must, therefore, wield considerable influence on the future of prices. The English market shows a great subsidence in prices, which is likely to be accelerated as soon as the fall shipping season terminates. In *American* we have not heard of any new business of importance, and enquiries are not so numerous as formerly. If our railroads are to be large buyers this fall, as at one time predicted, it is about time that some signs of it should manifest themselves, and it is to be confessed that the present quietude is very ominous.

Foreign Iron Rails	gold.	$48·00 @ $50·00	
*American Iron Rails	currency,	56·00 @ 60·00	
Import at N. York this month, tons,			....
Previously since January 1....	"		....
Total to date	"		....
Same time, 1873	"		41,449
Foreign Steel Rails	gold,	$83·00 @ $85·00	
*American Steel Rails	currency,	90·00 @ 95·00	
Import at N. Y. this month..tons,			7,621
Previously since Jan. 1	"		50,786
Total to date	"		58,407
Same time, 1873	"		65,084

OLD RAILS barely hold their own. The demand is very light, and a large quantity of hypothecated stock still menaces the market.

Double Heads	currency,		nominal.
T or Flange	"	$34·00 @ $34·50	
U or Bridge	"		nominal.
Import at New York this month	tons,		585
Previously since January 1	"		1,650
Total to date	"		2,235
Same time, 1873	"		9,282

SCRAP IRON.—Dull and drooping.

No. 1 Wrought	currency,	$35·00 @ $37·00

PIG IRON.—*American* remains dull and depressed. It seems impossible to get up any animation, and it now appears certain that any real revival must be preceded by a renewal of the demand for Railroad and Building Irons. Of good Forge Irons there is rather a scarcity, and these grades are moderately firm. *Scotch* is all in the hands of the dealers, and as the stock is very light, higher prices are asked and paid, as with the present cost no additions to the stock are likely soon to occur. Most of the higher brands are out of the market entirely.

American Forge	currency,	$25·00 @ 27·00	
No. 1 Foundry	"	30·00 @ 31·00	
No. 2 Foundry	"	28·00 @ 30·00	
Scotch No. 1 Foundry	"	34·00 @ 40·00	
Import of Foreign this month	tons,		900
Previously since January 1	"		22,703
Total to date	"		23,603
Same time, 1873	"		44,601

* These prices represent as nearly as possible the range, according to location of mill.

METALS.

Copper.—Sales of the week foot up 500,000 pounds Lake at 21c. @ 21¼c. to consumers and dealers, mostly the latter. The sellers of this Copper were parties who bought at between 19c. and 20c., and availed themselves of the improvement in price in order to realize. As regards the general position it is a sound one, and as long as no attempt be made to again force up prices, it will remain so, for at present rates Copper will continue to be taken by consumers. Bids are made for large amounts at 21c., while the asking price is 21¼c. @ 21½c. for Lake. There is but a limited demand from manufacturers at present, as they were supplied on the spot. The available stock of Baltimore is but small, and the prospects of a supply thereof are moderate; it sells at 21c. in lots, and in small quantities from store at 21½c. The general Copper market is pretty firm, without much doing, and will, in all likelihood, remain steady for some time to come. Receipts from the mines are ample, but the leading companies have not changed their programme; they may soon show more willingness to meet the views of consumers, and greater activity may result therefrom. The latest telegram from England in our possession is dated September 5, and quotes Best Selected £86, and Chili Bars, £77. The following is from our West Coast correspondent, dated Valparaiso, July 31st: "Copper in bars, under the influence of lower English quotations, has declined, and 350 tons Lota sold at $16·50 on board, while 50 tons Lambert fetched $16·75 on board; at the former price there were buyers also for Urmeneta, but owners prefer to ship it on own account. The asking price of $16·25, from on shore hence, purchasers are not willing to accede to at present, there being a lack of vessels to ship by. Of Regulus the sale of a cargo at $6·97½, on board, still transpired ere the last mail left, but since then no sales have been effected, the highest bid now being $6·85, at which nothing has been allowed to go thus far. Nothing doing in Ores. Total sales of the fortnight 9047 quintals at $16·25 @ $16·75, cash, on shore, and on board at Lota and Coquimbo, and July 14, 13,600 quintals Regulus, on board at Carrizal, at $6·97½. I quote Urmeneta and Lota, with 60/ steam freight, $16·50, on board, bid, and Bars, on shore here, $16·25, asked; Regulus, 50 per cent., $6·85, bid, and Ore, 25 per cent., $2·93¾, asked. Exchange, 60 days' sight, London, 44¼d. @ 44⅝d.; 90 days', 44⅝d. @ 45d." Manufactures of Copper have been unsettled in value since the combination ceased to exist. A meeting of Brass manufacturers is to be held on the 16th instant, when we shall further report. We nominally quote New Sheathing, 30c. @ 31c.; Bolts and Braziers, 32c. @ 33c.; Bronze and Yellow Metal, 22c. @ 23c., and Yellow Metal Bolts, 30c., net cash.

Tin.—There has been nothing done beyond a moderate jobbing business, nor is there any upward tendency perceptible, although jobbers are firm in their rates, especially as regards English, of which the present and prospective supply is quite limited. Straits are offered to arrive at 21½c. @ 21¾c., gold. On the spot the various descriptions may be quoted as follows: Straits, 21¾c. @ 22c., gold; L. & F., 20¾c. @ 21c.; English Refined, 21½c. @ 21¾c., and Banca, 25c. @ 25½c., all gold. The last London quotation per cable we hear of was, a couple of days ago, £93 @ £94 for Straits. Holland, by mail, is quiet once more since the improvement subsequent to the last sale took place, at 57½ guilders. The uncertainties of the Australian supply restrain speculation for better prices in Holland and elsewhere in Europe. Tin Plates have been quiet and nominal. The little done has been in a jobbing way merely, and all that remains to be done is to repeat our last quotations: I. C. Charcoal, $9·87½ @ $10·50, gold, per box; I. C. Coke, $7·87½ @ $8; Coke Terne, $6·75 @ $7; and Charcoal Terne, $7·75 @ $8, all gold.

Lead.—The price at which the government sells was on Monday last raised from 5·65c. to 5·75c., gold, and at this figure between 400 and 500 tons were disposed of without difficulty. There sold beside 400 tons Selby (California) at 5·70c., gold. Of this California Lead plenty more is expected, gradually, per steamer. We are thus to have a goodly supply of the metal all along, but not more than what consumption seems quite able to take care of. The stock of Foreign Lead is reduced and concentrated in one hand; yet, as the demand for it is not over brisk, it pretty much suffices for current requirements. We quote the same 6½c. @ 6⅝c., gold. Refined Lead commands 7c. @ 7⅛c., gold. Bar, pipe and sheet Lead is steady at 7⅝c., less 10 per cent.

Spelter and Zinc.—Spelter is dull; the Missouri agents here ask 6¾c., currency, but there is no demand for large parcels, and some Western brands occasionally turn up that even yet can be had at 6½c., currency. Foreign is firm at 6⅝c. @ 6¾c., gold, under European telegraphic limits. No sales can be reported. The mail just in brings the following from Hamburg, dated August 25: "Our market is remarkably firm. After 500 cwts. Silesian Union were sold at 22 marks, the same brand rose to 22·25, at which it exhibits a good deal of firmness, consumers evidently being in urgent want of it, and Breslau is also firm." P. S.—There have still been sold of the above brand 1000 cwts. at 22·20 marks. Sheet Zinc at New York is firm and cannot now be had below 8¼c., gold, at which some sales have been effected.

Antimony is quiet at 11¼c. @ 11½c., gold, the demand being restricted.

OLD METALS, PAPER STOCK, &c.

The market for Old Metals, Rags and Paper Stock still continues dull, and prices remain about the same as reported last week. There is still a good demand for Hemp and Grass Rope, while White Linen Rags, No. 1, are very dull. The demand for Old Metals is somewhat better than for a long time past, and dealers can easily dispose of their accumulations, if they would only lower their prices. The purchasing prices offered by the dealers are as follows:

Old Metals.—Copper, 15c. @ 16c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 4c.; Zinc, 4½c. @ 5c.; Pewter, No, 1, 19c.; do., No. 2, 8c. @ 12c.: Spelter, 5c. @ 5½c., Wrought Iron, 1½c.; Sheet do., ½c.; Cast, do., ½c. @ ¾c.; Machinery, do., ¾c.

Rags, &c.—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No. 1, 6c. @ 6¼c.; No. 2, 2½c.; White, No. 1, 6½c.; No. 2, 4c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 4½c. @ 5c.; Gunny Bagging, 1c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1¼c.; Grass Rope, 3c.

COAL.

The dealers in Coal complain that business is not as brisk as it ought to be at this season of the year; nevertheless, there has been a marked improvement over the preceding two or three weeks. Prices of Anthracite, however, are firm at the advanced rates. Retail dealers have their yards pretty well stocked, and as they have not yet been delivering to any extent, there is a considerable falling off of their trade. Dealers anticipate that in the months of October and November business will be very active. Anthracite is selling by the cargo at $5·25 @ $6·35.

The following are the prices charged by the Delaware and Hudson Canal Company for Coal, deliverable f. o. b. at Rondout or Weehawken during the month of September, per ton of 2240 lbs.:

Furnace, Lump	$5·25
Steamer, Lump	5·35
Grate	5·45
Egg	5·60
Stove	6·10
Chestnut	5·05

The freight from Rondout to New York, by the company's boats or barges, deliverable in the city of New York, is 50 cents per ton.

The distribution of the Coal mined by the Delaware and Hudson Canal Company to August 22 is as follows:

By Delaware and Hudson Canal	860,285
By Railroad, East	259,847
" West	331,906
" South	134,127
Total tons	1,586,155

The market for Bituminous Coal still continues very dull, and prices are nominally unchanged. A compromise has been effected between the boatmen employed on the Chesapeake and Ohio Canal with the various companies, and the strike is ended at present. We quote as follows: Cumberland, $6·75 @ $7; West Virginia, $7·40 @ $7·50; Pennsylvania and Westmoreland, $7 @ $7·25; American Cannel, $13; Broad Top, $6·25; Decatur, $6·25; James River Carbonite, $9; Youghiogheny, $7; Murphy Run, $7·40; Monongahela, $7·50; West Fairmont, $7·50; Sterling, Ohio, $12; Kanawha Gas, $13.

In Foreign there is very little doing, but there is prospects of some improvement. Our quotations are as follows Liverpool House Cannel, $17 @ $18; Liverpool Gas, $11; Newcastle Gas, $7 @ $10; Scotch, $7·50 @ $8.

The total of Anthracite Coal marketed for the week ending on the 29th ult. amounted to 287,913 tons, and for the Coal year 11,724,166 tons. The Bituminous tonnage for the week is 79,174 tons, and for the year 2,202,129 tons.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending September 8, 1874:

Hardware.

Bush R. T. & Co.
Wire rope, bdls., 79
Boker Hermann & Co.
Mdse. pkgs., 26
Arms, cs., 13
Beam & Murray,
Gun caps, cs., 2
Field A. & Co.
Mdse. pkgs., 4
Friedmann & Lauterjung
Razors, cs., 2
Cutlery, cs., 4
Haight C. & Co.
Hammers, cs., 1
Hilger E. & Sons,
Mdse. pkgs., 6
Hildick A. H.
Anvils, 30
Vises, 15
Chains, cks., 4
Chains, 1
Moore's J. P. Sons,
Arms, cs., 11
Roeblings J. A. & Sons,
Wire rods, lots, 188
Schoverling & Daly,
Mdse. pkgs., 6
Star Union Line,
Chains, cks., 16
Van Wart & McCoy,
Cases, 10
Wiebusch F.
Packages, 3
Order.
Iron wire, bdls., 268

Iron.

Congreve Chas. & Son,
Rails, 962
Hardy A. & Co.
Scrap, lots, 1; bbls., 4
Naylor & Co.
Fish plates, bdls., 1034
Bars, 8272
Owen Thos. J. & Son,
Scrap, tons, 10
Order.
Scrap, lbs., 49,150
Sheet, bdls., 9

Steel.

Brown Wm.
Packages, 62
Naylor & Co.
Cases, 38
Cast tires, 4
Rails, 651
Prosser Thos. & Son,
Tire forgings, 38
Woodford W. O.
Cases, 60
Order.
Scrap, tons, 100
Bundles, 75

Metals.

Bruce & Cook,
Tin plates, bxs., 533
Byrne Joseph & Co.
Tin, bxs., 500
Duncan, Matthews & Co
Copper, cks., 4
Hart Lucius & Co.
Tin, slabs, 160
Morris M.
Spelter, cs., 1
Naylor & Co.
Tin plates, bxs., 499
Obermann & Tiedman,
Tin plates, bxs., 5
Phelps, Dodge & Co.
Tin plates, bxs., 2292
Tin, slabs, 1296; ingots, 1120
Visser Simon de
Tin, slabs, 317
Order.
Antimony, cks., 34
Tin, slabs, 846
Lead, pigs, 1748; pcs, 815

PHILADELPHIA.

PHILADELPHIA, Sept. 8th, 1874.

The general expectation of an improved condition of the iron market, by the date of this writing, seems not to have been borne out by the situation. And yet there is more trade doing than is to be supposed from the character of most market reports issued. The sluggishness is rather in Foundries than in Forge Pig, the former being bought only to meet the demands of consumption, which are light, while the latter is in fair request. A careful inquiry among furnace companies elicits the statement that they do not care to sell ahead, while the current orders are equal to present production, no unsold accumulation occurring as yet. The feeling of furnace owners whose stacks are in blast, east of the Alleghanies, is strengthened somewhat by the prospect of a suspension of ore mining in the Lake Superior region, announced as likely to occur at any moment now, and which would undoubtedly give a slight advance to Pig Metal, owing to increased cost of stock. In Manufactured Irons the market is somewhat firmer for Bars, with, it is said, considerable orders offering West at the card rates in force previous to the late advance, which, however, are steadily refused. Here orders are as yet light, with, however, no disposition to shade the 3 cent rate. In Railroad Iron the best feeling noticeable in the trade exists, and some considerable orders are being placed at fair and remunerative prices. It is contended by manufacturers that the quotation of $55 as a standard price, at works, made in your city, is an unfair one. In exceptional cases transactions may have been effected at these rates, for iron made entirely from Old Rails, and of such quality as none of the leading roads would lay down. A fair iron rail may be sold at $58 @ $60, with present prices of Pig, but as greater scrutiny is now used as to quality than ever before, few of the established companies would accept a quality of iron for their use which can be sold under $60 @ $63 at this writing.

There have been and are still on the market several lots of hypothecated railroad iron, which are offered low to cover advances, but we are assured no large amount of standard iron can be obtained under above quotations. The following quotations fairly represent present prices in this market, viz:

PIG METAL.—No. 1 Foundry, $30 to $31; No. 2, $28 to $29; Gray Forge, $27; White and Mottled, $24.

BARS.—3c. per lb.

RAILS.—$58 to $63 for American, at works, as to quality.

OLD RAILS.—$34 to $34·50.

SCRAP.—No. 1 Wrought, $33 to $35, as to selections, and in fair request.

In the transactions of the last ten days are included sales of the following lots, viz:

Pig Iron.—No. 1 Foundry, Lehigh brands, 1600 tons at $30; No. 1 Foundry, Lehigh brands, 2000 tons, $30, furnace; No. 2 Foundry, 2500 tons, $26·50 to $27, furnace; No. 2 Foundry, 1500 tons, $28, furnace; Gray Forge, 2500 tons, $26, furnace; Gray Forge, 1200 tons, $28, spot, time and interest; Gray Forge, 1000 tons, New York delivery, $27 Hoboken; Gray Forge, 2500 tons, $27, spot; White and Mottled, 900 tons, $24, spot; Cinder Iron (Kentledge), 500 tons, $18, spot.

Rails.—Western Mill, 3700 tons, private terms; 56 lbs., 1800 tons, $54, at tidewater, time and interest; Light Rails, 1200 tons, private terms, Western delivery.

Old Rails.—Ts, 1500 tons, $34, spot; Ts, 1000 tons, equal to $35 here; Ts, 1000 tons, $32, Western delivery.

PITTSBURGH.

PITTSBURGH, Sept. 7, 1874.

PIG IRON.—The Pig Iron trade was less active, the volume of business reported having been comparatively light as compared with last week, and while the general tone is scarcely as strong as it was, and prices have suffered a slight decline, the general outlook is not as discouraging as some of those who always look upon the dark side of everything would make out. The recent suspensions here have no doubt had considerable to do with the slight reaction, to which reference has been made, especially as they were entirely unexpected, but there is no doubt but what there will be a steady consumptive demand during the balance of the year, as nearly all the mills are in operation, some of them working double turn, and, furthermore, some of them have little or no stock. The indications are, however, that the millmen will pursue a very conservative course, buy only for immediate wants, do as they did during the first half of the year—carry just sufficient stock to keep them going, and no more. Some few of them are pretty well stocked, having bought freely in June and the early part of July, but, as already intimated, there are others who have been adhering to the hand-to-mouth policy, and the outlook for the latter is more favorable just now than it was a month ago, although it is not likely that it will continue so, as the market will no doubt become stronger within a few weeks again, and producers still entertain hopes of being able to realize better prices between now and the close of the year. It is doubtful whether the production of good Forge Iron in this section of the country is equal to the consumption; there is reason to believe, in view of so many of the furnaces being out of blast, that it is not, and, furthermore, even if the market should improve, it is not likely that many of these idle furnaces would start up before spring, hence it is safe to infer that the production during the time in question will be comparatively light, also that prices will go no lower.

QUOTATIONS.

No. 1 Foundry	$29·00 @ 30·00—4 mos.
No. 2 Foundry	27·00 @ 28·00—4 mos
Gray Forge	26·00 @ 27·00—4 mos.
White and Mottled	24·00 @ 25·00—4 mos.
Hot Blast Charcoal	30·00 @ 35·00—4 mos.
Cold Blast Charcoal	45·00 @ 50·00—4 mos.
Blooms, as per quality	80·00 @ 90·00—4 mos.

MANUFACTURED IRON.—The general situation remains substantially as noted in my last, and the market presents but little that is really important. The recent advance, as expected, has curtailed the demand somewhat, but our mills are pretty well supplied, many of them sold from thirty to sixty days ahead, and little or no doubt is entertained but they will have about all they can do during the balance of the year. The advance in rates, so far as Pittsburgh is concerned, is closely adhered to, and as it is claimed that at two and eight-tenths the margin for profit is small, there is no room for cutting, and if it should come to that, which is not at all likely, it would be better for the mills to shut down than to cut under present rates, unless there should be considerable of a shrinkage in the cost of the raw material, which is not likely. Some are indulging in gloomy forebodings in regard to the immediate future of the market, but there is nothing real in the general outlook to warrant it. The indications are that, so far at least as Pittsburgh is concerned, there will be at least an average fall and winter trade, although it is not expected that the margin for profit will be as satisfactory as it has been of late years.

NAILS.—The Nail trade continues in an unsettled and very unsatisfactory condition, but it is hoped and expected that there will be a change for the better. The trouble is not so much a want of business, as it is in regard to prices, which are down to a point that yields no profit, scarcely cover actual cost of manufacture, and our manufacturers are not anxious for orders in the present condition of affairs. It is said that one or two Wheeling firms, in their anxiety to gain a footing in territory heretofore controlled by other competing points, have put prices down below actual cost, and this of course has a depressing effect upon trade at large. A meeting of manufacturers convened here on Thursday of this week, with a view of establishing prices, but nothing definite was accomplished. The whole matter was referred to a committee, with instructions to report at an adjourned meeting, which will take place this week.

SCRAP IRON.—The market continues very dull, as much so as it has been at any time this season, hence the expectations of dealers, in regard to a good fall trade, have not, as yet, been realized. Prices, however, remain without quotable change. There is still some little movement in Scrap Steel, as there has been all the season.

BUYING QUOTATIONS—CASH.

	Per ton.
No. 1 Railroad Car Springs	$47·00
Old Buggy Springs	40·00
Old Car Axles	38·00
Old Railroad Scrap	30·00
Old Blacksmith Scrap	25·00 to 26·00
Light Iron	15·00
Old Railroad Wrought Turnings	25·00
Stove Plate	15·00
Machinery Metal	18·00
	Per gross ton.
Old Car Wheels	$28·00

STEEL.—Trade, while it is not up to what some of the more sanguine expected it would be at this particular time—in other words, the fall trade has not opened up as satisfactorily as they had anticipated—it is perhaps about all that can reasonably be expected. The mills are all in operation, and there seems to be more complaint about "cutting" rates than there is in regard to a scarcity of orders. There is no doubt, however, but this matter will soon cure itself, and, beside, the reports in regard to cutting may be exaggerated. Some of the mills are pretty well supplied with orders, and they will all, no doubt, have about all they can do during the balance of the year.

The Pittsburgh *Commercial* of the 5th inst. says: The market for Pig Iron this week, when compared with last, has been very dull, and the volume of business much less. The prices realized are about the same, but we are compelled to say that there is no anxiety to buy manifested on the part of the mill owners, even at the prices quoted in our report. We hear of some furnaces that have sold up to October 1st, and others who are unwilling to accept present figures because it makes a loss, even at the lowest price at which ore can be had. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

400 tons gray forge	$26·50—4 mos.
250 tons gray forge	26·50—4 mos.
250 tons No. 1 foundry	29·00—4 mos.
150 tons gray forge	26·50—4 mos.
100 tons white and mottled	24·00—4 mos.
100 tons white and mottled	24·50—4 mos.
100 tons gray forge	26·50—4 mos.
100 tons Western, cold short	25·00—4 mos.
80 tons No. 2 foundry	27·50—4 mos.
50 tons No. 2 foundry	27·00—4 mos.
50 tons No. 2 foundry	27·00—4 mos.
50 tons No. 2 foundry	27·00—4 mos.
20 tons No. 1 foundry	29·00—4 mos.
20 tons No. 1 foundry	28·50—4 mos.
20 tons No. 2 foundry	28·00—4 mos.
20 tons gray forge	27·00—4 mos.
10 tons No. 1 foundry	29·00—cash.

ANTHRACITE.

100 tons gray forge	$27·00—4 mos.
100 tons gray forge	27·00—4 mos.
50 tons white and mottled	24·00—5 mos.

CONNELLSVILLE COKE.

200 tons gray forge	$26·50—4 mos.
100 tons gray forge	25·50—cash.

ALLEGHENY COKE.

1100 tons Red Bank	$28·00—4 mos.

HANGING ROCK CHARCOAL.

50 tons No. 1 foundry	$38·00—4 mos.

EASTERN CHARCOAL.

60 tons No. 1 cold blast	private terms.

CLEVELAND.

Messrs. READ & DICKEY, Iron Brokers, under date of September 7, write us as follows:

PIG IRON.—There is a perceptible improvement in the tone of the market for the past week, owing, no doubt, to the advance in Manufactured Iron. Sales of Gray Forge are improving, both in quantity and price, while there is a little more demand for other numbers. There is also more inquiry for Ore the past week, as the idle furnaces commence to scent a chance for profit in blowing in, if prices continue to improve. There are no fears expressed that the production will be again over increased, for the reason that a very small quantity of Ore will remain unsold after the wants of furnaces, which have been working steadily, are supplied. The mining product has been curtailed in almost exact proportion to the demand, and from all reliable accounts the decrease in shipments from the Lake Superior region this year will fall very nearly 50 per cent. short of those made last year, or, say, one-half. As there are but two months of the season of navigation left in which to operate, no great variation from this estimate can in any way occur. Prices remain as quoted in ours of last week, although, in some instances, refused.

CHARCOAL PIG IRON FROM L. S. ORE.

Nos. 1 and 2 Foundry	$35·00—4 m.
Nos. 3 and 4 Car Wheel	37·00—4 m.
Nos. 5 and 6	39·00—4 m.
Bessemer Metal, Charcoal	35·00—4 m.
Bessemer Metal, Bituminous	29·00—4 m.

BITUMINOUS PIG IRON FROM L. S. ORE.

No. 1 Foundry	$29·00—4 m.
No. 2 Foundry	27·00—4 m.
No. 1 Gray Forge Red Short	28·00—4 m.
No. 2 Gray Forge	27·00—4 m.
White and Mottled	25·00—4 m.

PIG IRON FROM BLACK BAND ORES.

Massillon No. 1	$33·00—4 m.
Massillon No. 2	31·00—4 m.
"New Gartsherrie" No. 2	33·00—4 m.
Muck Bar	$44·50 @ 45·50—60 days.

MANUFACTURED IRON.—The recent advance has worked so much to the satisfaction of all parties that we believe a further advance of 2-10 will be decided on at the meeting of manufacturers, to take place at Pittsburgh on the 11th inst. The demand has improved, and buyers are doing their best to sustain the mills in the stand taken. In doing so they are putting money in their own pockets; for they not only realize a direct profit on their stocks of Iron to the extent of the advance, but also, indirectly, on their stocks of Hardware, which will advance in keeping with improved prices of Iron. We not only find the advance well sustained, but already note a disposition among numerous mills of declining orders, except at full card rates, and although at first we were inclined, like many more, to doubt the feasibility of its being sustained, at present we are fully converted and prepared to accept it as a fixed and gratifying fact. We also look for further advances, as it would be against all precedent if the Pig Iron men do not succeed in getting better prices for their product, necessitating higher prices on Manufactured Iron to enable mills to get some profit.

SHEET IRON, as always at this time of year, is in good demand, which even the recent very sharp advance does not seem to curtail. Mills are rather crowded with orders already, and stocks in merchants' hands light. Several of the largest dealers have yet to place their orders, and are finding it difficult to do so even at present prices; so much for trusting too long to the "lower price" theory.

NAILS are in fair demand, which we think would be stimulated if prices would improve. As there will be a meeting of Nail manufacturers held next Wednesday for the avowed object of putting up prices, we look for an improvement in this branch of the trade immediately thereafter. We quote selling prices from store, here, as follows for "*car lots*":

	60 days.
Bar, Band and Hoop Iron	2·8
Sheet Iron, No. 24	4·8
Nails, 10d. to 60d	$3·50
Ship Spikes, ⅜ and larger	4·20

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of Sept. 7: We note improved inquiry for the past week, with increasing firmness on the part of Pittsburgh and Western mills. Prices are stiffer as regards Bars, Hoops, Bands, &c., and we quote the list unchanged and market firmer.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick	2·9 to 3·1 cts. per lb.
1 to 4½ wide by 1½ to 2 thick	
Round and square, ordinary sizes, from ⅝ to 2 inclusive	2 9-10 to 3 1-10c. "
Hoop Iron, 1¼ wide and upward	4¾ to 5c. "
Band Iron, from 1¾ to 4 in. wide	4 to 4¼c. "
Horse Shoe Iron ¾ to 1 wide by ⅜ to ½ thick	4½ to 5c. "
Norway Nail Rods	7¾ to 8¼c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	16½c. "
Machinery Steel	11½c. "
Cast Spring Steel	11c. "
Homogeneous Steel Plate	13c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·87½
" Mule Shoes " "	6·87½

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per lb.
Globe Horse Nails	23	24	25	26	28c.	per lb.
R. R. Spikes	5½ by 9-16 at 3¾c to 4c. per lb.					

CINCINNATI.

Messrs. ADDY, HULL & CO., under date of Sept. 7th, write us as follows: The market has ruled quiet throughout the week, without change in prices. Transactions have been almost entirely in Hot Blast Foundry grades. Standard Cold Blast brands are selling in very limited quantity at inside quotations.

HOT BLAST CHARCOAL.

Hanging Rock	No. 1	$33·00 @ 34·00—4 mos.
" "	No. 2	30·00 @ 32·00—4 mos.
" "	Forge	27·00 @ 29·00—4 mos.
Tennessee	No. 1	32·00 @ 33·00—4 mos.
"	Forge	27·00 @ 29·00—4 mos.
Alabama	No. 1	31·00 @ 32·00—4 mos.
Missouri	No. 1	33·00 @ 34·00—4 mos.
"	No. 2	30·00 @ 32·00—4 mos.

HOT BLAST STONE COAL.

Missouri	No. 1	$32·00 @ 33·00—4 mos.
"	Forge	27·00 @ 29·00—4 mos.
Ohio	No. 1	30·00 @ 31·00—4 mos.
"	Forge	27·00 @ 28·00—4 mos.
Scotch Pig, No. 1		

COLD BLAST CHARCOAL.

Hanging Rock	Car Wheel	$50·00 @ 55·00—4 mos.
Missouri	" "	48·00 @ 52·00—4 mos.
Kentucky	" "	50·00 @ 55·00—4 mos.
Tennessee	" "	48·00 @ 52·00—4 mos.
Georgia	" "	48·00 @ 52·00—4 mos.
Alabama	" "	48·00 @ 52·00—4 mos.
Machinery and Forge		45·00 @ 48·00—4 mos
Blooms		90·00 @ 95·00—4 mos.

LOUISVILLE.

Mr. GEO. H. HULL, under date of Sept. 7th, writes us as follows: The market remains about the same as at last report. Cold Blast Irons are neglected, and quotations for this class must be regarded as nominal. The demand for Hot Blast is light, and prices are without material change. The usual time, 4 mos., is allowed on the quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$32·00 @ 34·00
" 2 " " " "	29·00 @ 30·00
" 1 Forge, " " "	27·00 @ 28·00
" 1 F'dry, from Tennessee Ores	31·00 @ 32·00
" 2 " " "	28·00 @ 29·00
" 1 Forge, " "	26·00 @ 28·00
" 1 F'dry, from Alabama Ores	30·00 @ 32·00
" 1 " " Iron Mountain Ores	32·00 @ 34·00

HOT BLAST STONE COAL.

No. 1 F dry, from Missouri Ores	33·00 @ 34·00
" 2 " " "	30·00 @ 33·00
" 1 Forge, " " "	29·00 @ 30·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	50·00 @ 55·00
" " Tennessee Ores	46·00 @ 48·00
" " Alabama Ores	48·00 @ 50·00
" " Georgia Ores	48·00 @ 50·00
" " Missouri Ores	45·00 @ 48·00
" " Kentucky	48·00 @ 50·00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, Aug. 25, 1874.—*Metals.*—Although, from a general point of view, the European metal trade is giving but few evidences of greater activity than heretofore, and although the character of the dealings does not as yet give proof of a solid amelioration, we are glad to receive assurances from all quarters that the very best expectations of a speedy revival are entertained, and if makers have, for the time being, but a scanty return for their labors, it is confidently believed that the rebound will be all the more energetic, and largely compensate them when the turn of the tide begins to set in. The frequently referred to reports of a bountiful harvest in the various European countries encourages the hope that we shall be spared a disappointment under this head. *Copper.*—Although the European markets have been rather inactive during the week, firmness has been maintained, and there is apparently a determination to hold on to the metal at its current value. The Chili charters to the 15th instant have been 2000 tons pure Copper. Australian has been in good demand at London at £86. 10/ to £87. 10/; the uncertainty as to what Europe is to get of Lake Copper from New York has been rather a check on this description, but we have the fact sufficiently evidenced that, at present rates, consumption is able to take charge of it, and in spite of it English Copper has also moved off with ease across the Channel. The stock at Liverpool and Swansea on the 15th instant was 18,500 tons against 23,600, 18,200 and 18,900 in 1873-1871. We are quiet here, and, if anything, rather weak at 203·75 francs Chili Bars, 198·75 common do., 216·15 Ingots, 210 English Tough Cake, and 200 pure Corocoro Ore. Havre is quiet and nominal. Marseilles, also, has relapsed into an attitude of quietness on a basis of 220 Refined Chili Ingots. *Tin.*—Notwithstanding the one or two shillings advance asked by English smelters for English Tin, and despite the greater buoyancy of tone there, we are telegraphically informed from Holland to-day that the metal has become quiet once more at 57 to 57⅛ spot, and September futures, and that Billiton, available, has been done as low as 55¾ guilders. We can only repeat what we said on former occasions, that the uncertainties of the Australian supply continue to operate as a check upon the Dutch ruling of the metal. Here, at Paris, we have, nevertheless, been looking up, and are able to quote Banca, deliverable either here or at Havre, 262·50 francs; Straits, 252·50, and English at Havre or Rouen, 246. There is increased firmness at Marseilles; Straits' there 250, French and English, 265. *Lead.*—We can only repeat former reports as to the excellent position in which this metal is placed in the leading European markets. Stocks have everywhere reached a low ebb, and this well authenticated fact imparts firmness. At the same time the Spanish mines have ceased to turn out what consumption is accustomed to draw from that quarter, and as it looks as though the civil war in the Peninsula were to be indefinitely prolonged, consumers fear that they will soon be at the mercy of holders. This sufficiently explains, we think, the steady demand which prevails everywhere in Europe. England is steady, with comparatively moderate dealings for the want of material to operate upon. Here the transactions are also circumscribed by reason of a scanty supply; French Lead is 53·50 francs, and other sorts are 53, while Marseilles is firm and unaltered at 54. *Spelter.*—While Liverpool has continued quiescent, London has at length been stirred up to a moderate extent, and has ranged from £21. 15/ up to £22. 5/, cash. Small though the dealings may have been they show an improvement on previous weeks. There has been but a limited business done in our own midst, but holders are as firm as ever. Silesian here and at Havre, 56·50 to 57 francs. Marseilles has remained quiet. *Iron.*—The improvement in the French Iron trade we have had occasion to allude to in previous weekly reviews, seems to be kept up, and if the situation thus brought about cannot be called a brilliant one, we have every reason to feel content, when we come to compare the same with the state of affairs in Germany, Austria and Belgium, where an almost unbroken calm continues to prevail. Prices at the North, in the Muerthe and Moselle, as well as in the Ardennes, are firm, with a slight tendency toward an improvement. Old Rails are in better request, which is an encouraging sign. *Coal.*—The attempts recently made to put up the price of Coal in France have been speedily abandoned in consequence of the continued low ruling in the foreign market. It should be remarked, on the other hand, that there has been no accumulation of stock, and that prices have kept steady in consequence. The Pas de Calais has been tolerably active, while the remaining Coal regions have remained quiet. At Paris we have been as stagnant as we possibly can be—alarmingly so, and English and German competition causes apprehensions to our companies.

BELGIUM.

(Le Commerce.)

BRUSSELS, Aug. 24, 1874.—*Iron.*—Matters are still unsettled in the Iron trade. The impression that a more normal activity will soon prevail is as strong as ever, but we are still waiting, and in uncertainty, as to the precise moment when the turn may come. Nor are they much better off in England, where, in spite of lower Coal and a rearrangement of wages, the formerly active month of August is drawing to a close with but few orders on hand, and a slack

state of affairs in both Finished Iron and railway manufactures. Belgium being but a small country, and consuming, fully equipped as we are, but little, yet possesses exuberant productive forces in the Iron branch, and thus mainly depends on the export trade. The great countries which surround us, France and Germany, have of late years learned to do without us, and there remains no other resource for an outlet on a more extensive scale but to cast our eyes across the seas. It is about time that we should perceive what is coming. The almost total loss of our near-by trade; the few smaller countries in Europe, where we compete with English Iron industry, are also making preparation for home manufacture. Very little is transpiring here, if we except a few orders for Finished Iron and Sheet on apparently satisfactory terms. The Luxembourg Blast Furnaces seem to cling stoutly to their Pig Iron, and foretell a speedy raising of prices. A subject of interest, which we call attention to, is the decree of the Spanish government of the 30th of June, now promulgated, according to which Iron and Steel Rails and appurtenances will be admitted free of duty into that country.

GERMANY.

(Borsenhalle.)

HAMBURG, Aug. 26, 1874.—*Metals.—Copper.*—The uncertainties which overhang the Copper trade consequent upon the unexpected, not to say extraordinary, movements at New York, have been productive of a listless state of affairs in Germany in this metal, and Drontheim here has become dull and nominal at 89 marks, while Chili and English at Stettin are 29 to 32 thalers, and flat. *Tin* had been stirred up by a good demand for consumption, and some business was done with great firmness in prices, and even an improvement in some instances, but we are informed over the wires that Holland is relapsing into quietude, and may soon be on the downward track once more, in view of the uncertainties of Australian shipments and the misgivings connected therewith. Banca, here, commands 1·08 marks, and English 1·06 to 1·08. *Lead.*—The identical causes which sustain and push up the value of Lead elsewhere in Europe, are in operation in our own country. Consumption has been gradually outstripping production, the latter being crippled at its main source, the Spanish Peninsula, and it is impossible to foretell how long the Carlist war will last, well matched as the contending forces seem to be; hence it is fair to presume that the tendency of Lead will, if anything, remain an upward one, consumption evidently being rapidly on the increase by the more general adoption of Lead pipe in the more opulent cities of Central Europe, and a more general return to the use of White Lead and the abandonment of Zinc White. For German Lead more money is asked here, and from 25 marks the price has been raised to 25·25; English we quote 25. Spanish Lead there is none to be met with any more for reasons given above. Lead at Stettin is steady at 7¼ to 8 thalers, German; and 8⅛ to 9, Spanish. *Spelter*, not getting down in sufficient quantities from the Silesian mountain regions, remains firmly supported here at 21·75 marks and at 7¾ to 8 thalers at Stettin.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Aug. 25, 1874.—*Tin.*—The market remains remarkably quiet. Banca from the late auction has been sold at 57¼ guilders; September delivery has been dealt in at 57, and transactions have taken place in Billiton at 55⅛. The Netherland Trading Society will sell at auction, on the 2d proximo, 326,659 kilos old Japanese Bronze and 45,607 do. Copper.

EAST INDIES.

(Clark, Spence & Co.)

COLOMBO, Ceylon, July 25, 1874.—*Plumbago.*—Nothing doing in this article, and values unchanged, owing to the falling off of demand. Natives are stopping digging operations, rather than accept a rebate in prices. The Catherine Scott sailed for New York yesterday with 6780 cwts. Plumbago. Total season's shipments to the Atlantic States 31,410 cwts. against 92,558 in 1873. Total Ceylon export, 139,375, of which 105,430 to Great Britain, 2330 to the Continent, and 215 to Australia. The falling off to the United States deserves notice. The market closes quiet, as follows: Free on board, with commission, per ton, exchange at par, Lump, 336/; Chips, 199/6; and Dust, 115/6. Freight to New York, 75/. Exchange has further declined, owing to the vast amounts of money going forward from India to Europe. We quote 6 months' credits on London 1/10¾.

(Gilfillan, Wood & Co.)

SINGAPORE, July 10, 1874.—*Tin.*—After advancing to $25·87½ per picul, has declined, and small sales are reported to-day at $25·55. Stocks are moderate. Total shipments thus far this year to the United States, 26,779 piculs, against 16,281, 25,936, 20,460, 26,134, 17,557 and 11,972 in 1873 to 1868. The John Worster is loading for New York at £2. 10/. No vessel up for Boston. Exchange, 4/3¾.

CHINA.

(Arnhold, Karberg & Co.)

CANTON, July 17, 1874.—*Lead* inactive and unchanged; with small stocks, however, and light supplies anticipated, holders show no disposition to meet the little demand prevailing. *Tin.*—Advices from the North being less favorable, the demand has almost subsided, and closing quotations exhibit a fall of 25c. per picul. *Quicksilver.*—The demand is almost *nil*. Sales, to arrive, at $173 per picul are rumored, and the market closes with a downward tendency. We quote Lead, $6·90 to $7·20 per picul; Tin, $25 to $27·25, the latter Funghing Chop; English Quicksilver, $184 to $184·50; and California, $186 to $187, nominally. Exchange, 5/10½.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., Aug. 24, 1874.

THE BRITISH ASSOCIATION

has inaugurated its sittings at Belfast, and although that "Athens of Ireland" is just now overshadowed by a great strike, the session promises to prove successful, if one may judge from the papers already read and those promised. Professor Tyndall, the president for the current year, lead off with an opening address fully characteristic of the man and his ardent love of science, and composed, as well as delivered, in that admirable, cogent style which has made the clever professor the center of by far the largest and most miscellaneously composed circle of admirers that has ever surrounded any scientist in this country. In the metropolis I can, of my own knowledge, aver that there is no other man of science who has half the number of workingmen admirers that Tyndall has—a fact which redounds quite as much to the credit of the audience as to the demonstrator. At Belfast, however, the professor chose to review the works and efforts of Darwin, Spencer, and others, rather than to devote himself to the propagation of any new theory of his own, although it must be said that his powerful remarks anent the theory of evolution and the formation of all matter, whether animate or inanimate, from molecules, has apparently involved him in a dispute with those who pin their faith wholly and absolutely to a literal interpretation of the beginning of Genesis. Several of the papers in the mechanical section would be of much interest to your readers, and I therefore do not doubt you will reproduce them as occasion may offer.

DEATH OF SIR WILLIAM FAIRBAIRN.

This eminent individual—a man who, in his day, had probably effected more improvements, and changes in a certain section of applied mechanics than any other—died at Moor Park, Farnham, on Wednesday last, being then in the 85th year of his age. Sir William was a baronet, a civil engineer of world wide eminence, and a Fellow of the Royal Society. He was born at Kelso, Roxburghshire, Scotland, in 1789, and having been educated at Newcastle-on Tyne, went into business at Manchester. In 1835 he brought to practical maturity a series of experiments in the building of iron vessels, and soon after aided Stephenson in a material degree in the construction of the Menai Bridge. I cannot here devote any due amount of space to his noteworthy acquirements and inventions, but it is only just to state that, as an inventor, of machine tools and water wheels, as an accomplished millwright, and as a patient experimentalist into the strength of iron, tubes, &c., he was probably unequalled. He was also one of the founders of the British Association.

MINERAL AND METAL STATISTICS.

It is one of the gravest faults of a national statistical office that the results of its labors never become known until a period too remote for the information to be either useful or interesting. Thus we are just furnished with figures showing the comparative quantities and values of the coal and metals produced from British ores in the United Kingdom from 1859 to 1872. The values given are those at the place of production. As to coal, we find that in the 14 years the rise in the yield was from 71,979,765 tons in 1859 to 123,497,316 tons in 1872, or an average increase of about three and three-quarter million tons annually. This increase was comparatively steady, although in two years there was a decrease. In 1862 the yield fell by two million tons below the previous year, but recovered in 1863 by a rise of five millions, and in 1868 the supply was more than 1,000,000 tons below 1867, but the fall was again followed by a large rise. In 1872 the yield was about 6,000,000 tons in excess of 1871. While the supply was nearly doubled, its value was nearly trebled, and had risen from £17,994,941 in 1859 to the enormous sum of £46,311,143 in 1872. This, it must be remembered, was the estimated value at the place of production. The relative value of a ton of coals, as furnished by the comparison of these figures, was 5/ a ton in 1859, and within a fraction of 7/6 a ton in 1872. This increase in value had been accompanied, and had partly resulted, from our large consignments of coal to other countries, our exports under that head having nearly doubled in the same period to which these figures refer. The produce of the metals from British ores show very different results. The yield of pig iron had risen from 3,712,904 tons in 1859 to 6,741,929 tons in 1872, an increase of about 3,000,000 tons. Fine copper had decreased from 15,770 tons to 5703. Metallic lead had also slightly decreased—namely, from 63,233 tons in 1859 to 60,420 in 1872. White tin showed a slight rise from 7100 tons to 9560 in 1872, but the latter yield was a thousand tons below the two years immediately preceding. Zinc had risen from 3697 tons to 5191, and the silver extracted from the lead had risen from 578,277 ounces to 628,920 ounces. The gross value of the pig iron had doubled with the quantity raised, and thus the relative value in 1859 and 1872 was the same. The value of the fine copper and metallic lead had decreased almost in the same proportion as the supply. The value of the white tin had, however, risen far beyond the rise in the supply, for while a ton in 1859 was worth £131, in 1872 its value was £152. The relative value of zinc had also risen, for a ton which was worth £20 in 1859 was worth nearly £23 in 1872. The value of silver remained almost the same. In the other metals returned we find that the produce of British gold had fallen almost to nothing. In 1861 the yield of 2784 ounces was worth £10,816. In 1862 the supply had nearly doubled, and had risen to 5299 ounces, valued at £20,390. In 1863 the yield fell to 552 ounces. In 1864 it rose again to 2887, and after several fluctuations in 1869 it stood at the minimum of 18 ounces. The total value of the coal and metal raised in 1859 was £31,680,581, and in 1872 it had risen to £68,380,976, or more than double, the increase being chiefly from the coal supply.

OUR FOREIGN TRADE.

You will, doubtless, notice a leading article in the London *Times* dealing at some length with the topic with which I have headed this paragraph. The *Times* reviews the situation at some length, glancing at the facts that within the last few years a united German Empire has sprung up, and by its resources and strength threatens to become a formidable rival—whether regarded as a non-purchaser or a *bona fide* competitor with us in other markets. Then, says the *Thunderer*, there are the United States, which have consistently pursued the hardest and most uncompromising system of protection the world has met with in modern times (ever since the civil war), in order to foster the native industries. Then look at Belgium, Italy and France, pursues the *Times*—they have largely increased their mercantile marine tonnage since 1860, and Russia has made great strides in her railway building. The exports of machinery from the United States particularly troubles the *Times* leader writer, and the growth of Belgium is disquieting to him, but he is pleased to sum up his researches by stating that "nobody is absolutely cutting us out." He thinks that with our enormous superiority in the mere carrying trade of the world, our numerous colonies and our vast foreign possessions we are, in spite of free trade, almost beyond competition within a certain limit." At the same time he says: "It is evident enough that year by year competition is becoming keener, and that, therefore, it would be impolitic to sit still and foolishly suppose we must have it all our own way." I should say competition *does* grow keener—anybody in business knows *that* fact well enough, without having recourse to that distinguished Italian fount whence flow the politico-economic inspirations of the leading journal of the world.

THE GROWTH OF MIDDLESBOROUGH.

There is hardly any town in the old world—certainly not in the United Kingdom, saving, in a little less degree, Barrow-in-Furness and Sheffield—which has grown and increased in population with such amazing rapidity as Middlesboro'-on-Tees, in North Yorkshire. Already over 1000 houses have this year been built, and whole streets are still being put up. The same progress marks the erection of blast furnaces. I quote the following additional details from the *Builders' Weekly Reporter*:

"The total estimated production of pig iron manufactured in Great Britain is about 6,000,000 tons per annum, and of this one-third is said to be manufactured in Middlesborough alone, to produce which 140 blast furnaces and 1000 puddling furnaces are at work in the district, and the number is constantly increasing. As an evidence of the extraordinary rise and increase of the town, it may be stated that in the year 1830, when Messrs. Joseph and Edward Pease, and the other members of the Society of Friends associated with them, purchased 500 acres of land, and commenced the building of the town, the then village on the south bank of the Tees containing only 130 inhabitants, the chief dwellings in the place being four farm houses. In 1841 the population had risen to 5709, increased in 1851 to 7893. But it was not until 1854 that the expansion of the town began with such extraordinary and unprecedented strides, when the iron manufacture was first developed. It was during this year that the first shipment of pig iron was made, and the iron stone rock, 16 feet in thickness, being shortly afterward found in the district, blast furnaces rose rapidly around the mines, and in 1861 the population had increased to 18,273, having considerably more than doubled itself during the ten years from 1851. In the next decade, from 1861 to 1871, the population had again much more than doubled itself, being 39,234, whilst it has been ascertained that its population during the present year, 1874, is upward of 44,000, and that it is now increasing at the rate of 5000 annually. It may be further stated that the area included within the municipal borough is 2100 acres, and that about one-half of this is already built upon, whilst, as already intimated, new houses are in course of erection at the rate of 1000 yearly. From being a small and obscure village or hamlet, Middlesborough has, in a comparatively brief period, become one of the most important manufacturing centers in England, possessing its royal exchange, town hall, free library, public park, and other public buildings and places of resort. It has also a large dock, constructed at an outlay of more than £250,000, together with a steam ferry, and other marine conveniences, and has been constituted a separate and independent port. It is also incorporated, having its mayor and town council; and, finally, it has, within the last few years, been raised to the dignity of a parliamentary borough, Mr. Bolckow, who was the first to establish iron works in the locality, being its first and present representative. Middlesborough has not inaptly been termed the 'Iron Metropolis' of England."

SCOTCH PIG IRON MARKET.

Up to about Tuesday quotations were fairly maintained, although there was a quiet market, and an evident expectation of lower prices—an expectation naturally caused by the knowledge that a considerable number of furnaces were again being blown in. This was the case when the cablegram was sent you, but on the day following, and on the Friday, the flat tone became more decided, and prices, both of warrants and makers' brands, gave way several shillings per ton, there being 109 furnaces out of a total of 156 in blast on the latter day. The circulars quoted below give an accurate reflex of the market since my last letter. Writing on August the 18th, Messrs. Wm. Colvin & Co. (Glasgow) report that "the warrant market has been quiet but steady during the past week, the price ranging from 89/6 to 87/. To-day a few transactions took place from 87/6 up to 88/, closing with sellers at 88/, and buyers offering 87/9. There being now more furnaces in blast, some brands are a little more plentiful. The undernoted are current quotations:

	Deliverable alongside No. 1.	No. 3
G. M. B., at Glasgow	92/6 to 94/	84/ to 85
Gartsherrie, "	116/	91/
Coltness, "	117/6	95/
Summerlee, "	111/	87/6
Carnbroe, "	98/	87/6
Monkland, "	95/	85/
Clyde, "	95/	85/
Govan, at Broomielaw	93/6	85/
Langloan, at Port Dundas	115/	91/
Calder, "	115/	87/6
Glengarnock, at Ardrossan	102/6	87/6
Eglinton, "	94/	85/
Dalmellington, "	94/	85/
Carron, at Grangemouth, selected	105/	....
Shotts, at Leith	110/	90/
Kinneil, at Bo'ness	95/	84/
Bar Iron	£10	
Nail Rods	10	

A day or two later (Aug. 21st) Messrs. James Watson & Co. (Glasgow) thus remark: "We have to report a flat market for Scotch pig iron; warrants have declined from 88/ to 84/ at which we close to-day sellers, buyers 83/9. Shipments last week were 9488 tons against 10,717 tons in the corresponding week of 1873. We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow	90/	83/
Gartsherrie, "	111/	91/
Coltness, "	116/	93/6
Summerlee, "	108/6	85/
Langloan, "	115/	87/6
Carnbroe, "	97/6	85/
Calder, at Port Dundas	113/6	85/
Glengarnock, at Ardrossan	99/6	86/
Eglinton, "	90/	82/6
Dalmellington, "	91/	82/6
Shotts, at Leith	107/6	87/6
Kinneil, at Bo'ness	90/	83/

CLYDE SHIPBUILDING TRADE.

The Clyde shipbuilders continue to be moderately busy, but it is to be noted that the new contracts are fewer than of late, and refer to smaller classes of vessels. A large proportion of those now on the stocks are sailing ships—in fact, during July half the number launched were sailing vessels, which are just now being preferred, owing to the dearness of iron vessels and the high price of fuel. The tonnage floated last month exceeded July, 1873, by 200 tons, but was 4000 tons below the total of that month in 1872. *Iron* furnishes the following figures and details:

	Month. Vessels.	Tons.	Seven Months. Vessels.	Tons.
1874	10	15,400	100	143,100
1873	10	13,600	93	145,700
1872	17	19,000	117	123,500
1871	15	11,000	98	98,000
1870	13	13,000	113	101,000
1869	14	11,900	124	110,800

"The steam vessels launched during the mouth of July were as follows: The Voorwarts, 3000 tons, 400 horse-power, for the Stoomvaart Maatschappig Nederland, for the Holland and Java mail service, by Messrs. Elder & Co.; the Chyebassa, 2600 tons, 350 horse-power, for the British India Steam Navigation Company, of Glasgow, for the East India and China mail service; the Amarapoore, 2600 tons, 300 horse-power, for Messrs. P. Henderson & Co., Glasgow, to trade between Rangoon and Clyde, by Messrs. Scott & Co.; a steamer of 1000 tons, for the Eastern and Australian Steam Shipping Company, of London, for the Singapore and Sydney trade, by Messrs. Henderson, Coulborne & Co.; a steamer of 500 tons and 50 horse-power, for a Liverpool firm, by Messrs. Henry Murray & Co. The sailing vessels were: The Thessalus, 1850 tons, for Messrs. A. & J. H. Carmichael, Greenock, for the East India trade, by Messrs. Barclay, Curle & Co.; the Eurydice, 1450 tons, for Messrs. Baine & Johnston, Greenock, for the East India trade, by Messrs. R. Steele & Co.; the Auckland, 1250 tons, for Messrs. P. Henderson & Co., Glasgow, for the Clyde and New Zealand trade, by Messrs. R. Duncan & Co.; the Workington, 1250 tons, for Messrs. Hargrove, Ferguson & Co., Liverpool, for South American trade, by Messrs. Macfayden & Co.; and the Daylight, 100 tons, for Messrs. Fordyce & Sons, Glasgow, by Messrs. Swan & Co."

NORTH OF ENGLAND IRON TRADE.

In this important district (alluded to in the foregoing description of Middlesborough, its chief town) a better inquiry for pig iron is reported, although there is no pressure in any quarter. Pig iron figures now rule as under: No. 1 foundry, 76/6; No. 2 foundry, 73/; No. 3 foundry, 71/; No. 4 foundry, 65/; No. 4 forge gray, 58/; No. 3 forge mottled, 57/; No. 6 forge white, 56/; refined metal, 86/; Kentledge, 67/6; and cinder pig, 50/ per ton, for net cash, f.o.b. on the Tees. Finished iron is not much sought after, the rail makers being particularly outspoken in their dissatisfaction at the non-receipt of large orders. They continue to receive a few small orders, with here and there one of fair dimensions, but the "big fishes" that run up the profits are not forthcoming. The Northeastern Railway Company had somewhat stimulated local curiosity in this district by inquiries about tenders for 20,000 tons of iron rails, but the specifications have not yet been given out, added to which there is a rumor that the company meditate laying down steel rails instead of iron ones, in which eventuality it is hardly likely that Cleveland will be able to take the matter in hand.

THE SHEFFIELD DISTRICT.

There is a little movement here and there, but although it cannot be said that there is any real improvement in the general state of trade, it is not to be denied that there is a better tone prevalent, and a more hopeful feeling as to the course trade may take during the autumn and winter.

A section of the manufacturing community is sanguine that, with the lower prices of fuel and a slight reduction in wages, we may expect an augmented demand for many classes of goods, which are thus quoted at lower rates. Certain kinds of steel and some brands of iron have already been reduced, and will probably come down a little more when the miners' wages question has been finally disposed of.

The coal traffic is below the average, and it is mentioned that the decrease during the past seven months to the metropolis alone—as compared with the corresponding period of last year—amounts to about £100,000, of which not less than £35,000 will have to be borne by the Great Northern Company. The late strike was responsible for part of this great diminution, the Great Northern having suffered to the extent of about 33,400 tons (when compared with the same period of 1873) during the three weeks it lasted. From Langley Mill, Clay Cross and other Derbyshire collieries, situate on the main line of the Midland Railway Company, a large tonnage continues to be sent to London and to stations on the Great Eastern system.

Of late a good reciprocal business has sprung up between the South Yorkshire colliery district and the newly-developed North Lincolnshire ironstone field. Several of the Yorkshire firms, very naturally attracted by the continuity of the Lincolnshire district, have become interested therein, and in some instances have erected blast furnaces on the spot. In other cases the ore is sent into South Yorkshire for smelting, reciprocity being gained by utilizing the wagons on their return journeys for the conveyance of coal and coke. At the present time a considerable quantity of coke is being made at Silkstone for the use of the Frodingham (Lincolnshire) Iron Company's furnaces at Frodingham. In the more immediate neighborhood of Sheffield the majority of the blast furnaces are being worked with Northamptonshire ores, while in the cases of two or three leading companies, Spanish ores are being tried, as well as others from Elba, Algeria and other parts of Northern Africa. Owing to the apparently interminable Spanish civil war, the ores of that country cannot at present be profitably used, to the material loss of several British iron companies.

Hematite pigs, from the Cumberland and Barrow district, which you are aware are largely used here a bouts, are a little easier to buy, current figures being these: For Bessemer hematites, No. 1, 95/; No. 2, 92/6; and No. 3, 90/; ordinary being 90/ for No. 3; 87/6 for Nos. 4 and 5, 105/ for M. and W. At Maryport No. 4 is 90/, and M and W can be bought for 90/. Bessemer No. 3, at the same places, is quoted 95/ per ton. Scotch pigs for founders' use are not obtainable, many brands being still excessively scarce.

In common with the same classes of iron-makers in other parts of the kingdom, the puddlers and shingiers employed in this district have received an advance in wages of 3d per ton. A local newspaper dryly says that the effect of this "arrangement will be to raise the men's wages when work is slack, and to reduce them when it is plentiful."

Whether this be the case or not, it is quite clear that an advance of wages is just now altogether a step in the wrong direction. Iron and steel cannot very well be dropped with a rise in wages which is almost sufficient to counterbalance the fall in the price of coal, and which may for some time to come hinder the proper progress of the local iron trade. At present both the iron and steel industries are exceedingly quiet, there being little activity even in departments—such as the Bessemer—hitherto fully engaged. The rail mills are only indifferently off for work, taking them all round, and there is not a great call for axles, springs or tires. Some few firms are pretty well off for work in these respects, but as a rule the inquiry is on a very limited scale. It will be seen from the undernoted reports of several coal and iron companies in this district that they are still able to scrape up a respectable amount of profit—despite the dullness of trade, and the "high" wages of the miners and others. Thus at the annual meeting of the Northfield Iron and Tire Company, limited, Rotherham, a profit of £3111. 4/5 on the year's working was shown. It was decided to appropriate it toward the loss of the previous year.

The report of the Sheepbridge Coal and Iron Company, limited, was issued on Wednesday to the shareholders. After paying a total dividend for the year of £12. 7/6 and £2. 5/ on the £55 and £10 shares respectively, it is proposed to carry £50,000 to the reserve fund. The directors of Samuel Fox & Co., limited, Stockbridge Works, Sheffield, in their report, state the year's profits to be £39,351, making, with the balance from last year, £67,655 available for dividend. Ten per cent. is to be paid as dividend, and £36,000 is written off in extinguishment of the goodwill; and the balance of the purchase money (£43,055) has also been paid off during the year. The annual report of the Staveley Coal and Iron Company, limited, near Chesterfield, states that the net profit for the year amounts to the sum of £263,921. 4/10. Out of this dividends are paid of £15 per share on the A and C shares; and £2 per share on the B and D shares, free of tax in all cases. £60,000 is added to the reserve fund, leaving £32,111 to be taken forward to next year's account. The directors observe that the extraordinary demand for coal and iron was seriously checked in the early part of the year, and that considerable depression prevails throughout the iron and coal districts. They have made every possible provision for meeting the increased competition in the trade.

I cannot report that there is a great difference in the cutlery trade—nor am I aided in any way by the "trade report" of one of the local newspapers, which inanely meanders over dull exports from journals in various parts of the country, and then insults the intelligence of local readers by dubbing it "trade of Sheffield." The table knife houses are, if anything, doing a little better in carvers' and good ivory goods, beside a little season business in common cutlery for seaside resorts. These are also fairly good customers for cheap electroplated and tinware. Spring cutlery belies its designation. It won't move off at all, few merchants being able to get rid of any quantity. Razors meet with a very respectable sale—the best descriptions being readily disposed of, and common kinds having been in good request since the late reduction in prices.

BIRMINGHAM AND SOUTH STAFFORDSHIRE.

On the Birmingham and Wolverhampton 'changes there is a fairly good, but by no means large, inquiry for finished iron in small lots, but the large buyers steadily keep out of the field, and have either placed their favors in Belgian hands or have expressed a determination to "hold on like grim death itself" until branded bars are officially quoted at £10 per ton. That time, at present, appears remote, quotations being at present somewhat steadily upheld. It is true, nevertheless, that manufacturers are not just now binding themselves down by any arbitrary hard and fast rules as to prices, but are more than ever anxious to take each specification on its own merits, and endeavor, by special quotations, to meet the exigencies of what is put before them. Sheets for roofing and galvanizing purposes are still in better request than any other kinds of finished iron, and are quoted at about £12. 10/ to £13 for singles. Most of the Staffordshire iron works are only going part of the working hours; but at the principal half dozen or so establishments full time is being made. The iron founders, engineers, railway wagon builders and safe makers are all doing an encouraging stroke of business. In one or two branches of Birmingham hardware there is a little more work, whilst in several other instances lassitude prevails. The patent (Ewbank's) nails sold by the thousand (not those by the cwt.) have been reduced 2½ per cent. Other makers of the same class of nails have followed suit by advancing discounts 2½ per cent.

THE SOUTH WALES DISTRICT

The South Wales district has latterly been singularly unfortunate in the matter of wages disputes. First, there came the great strike of miners and iron workers, then smaller strikes of miners; afterward the serious tin plate workers' dispute, close upon the heels of which came a reduction of 10 per cent. in the iron workers' pay, succeeded by a similar drop in the colliers' wages. Now the whole of the coal owners have notified a further reduction of 10 per cent. in the colliers' wages, to take effect on September 1st, and have also intimated that if that drop is not quietly acquiesced in, they will notify a further fall. The men are much agitated, and there seems every probability of a strike. The tin plate trade is becoming much healthier, and there is a little movement in the iron trade. Abadare and Dowlais have been doing a trifle more, and even at Cyrfarthfa there are a furnace and a mill going. Rails are not worth looking after with buyers offering not more than £7. 10/, at which price they cannot be made except at a loss of 5/ to 10/ per ton, consequently few orders are being booked.

THE METAL MARKETS.

The metal markets have been tolerably buoyant since my last report, but there has not been a very extensive business. Tin held up well at the beginning of the week, but toward its close there were symptoms of weakness.

Writing on Friday, Von Dadelszen & North report as under: "*Copper.*—Market very quiet. A few hundred tons of Chili reported at £76 for g. o. b., and £76. 15/ to £77 for picked brands. The charters for first fourteen days August are telegraphed as 2000 tons. A fair quantity of Wallaroo sold at £87. 10/; Burra, £86 to £86. 10/. English dull. *Tin.*—Little done, and the close is rather lower. Straits, £93. 10/ to £94; Australian, £92. 10/. English tin in good demand. Price was advanced the beginning of the week to £98 for ingots, £99 for bars. In Holland, steady market. Banca, 58 fl.; Billiton, 55¾ fl. Tin plates steady, but not animated. Lead, £21. 5/. *Spelter.*—Common has been sold at £21. 15/, special at £22. 10/. Quicksilver, £23."

The *Mining Journal's* metal summary runs thus: "*Copper.*—There has been very little done in this metal during the past week, but general firmness characterizes the market, and sellers are indisposed to part with their holdings except at the full current quotations of the day. Good ordinary Chili bar copper is now realizing about £76. 5/, cash, but at this price buyers restrict their transactions within the limits of present requirements. Yellow metal is in but limited demand, and prices remain unchanged. In English tough copper, as well as sheets, there is very little doing for foreign shipment, and what little there is doing in the market is very much confined to foreign descriptions. On Monday, Chili bars, picked brands, changed hands at £76. 15/, g. o. b.; £76. 5/, cash, and 50 tons, £76. 10/, to arrive. Wallaroo realized, £87. 10/, cash. On Tuesday, at the Swansea ticketing, 1364 tons of ore sold at an average price of 14/4 per unit, and the Cape at 15/. Chili bars again easier; picked brands sold at £76. 10/; g. o. b., £76. 5/; English quiet; tough, £83 to £84; India sheets, £90. *Lead.*—There is no variation to report in this metal, which remains steady, the price for good soft English pig being about £21. 5/. *Spelter.*—The long protracted dullness still continues, and transactions are very limited. Silesian is quoted £22. 5/, but considerable concessions would have to be submitted to to induce buyers to come forward to any extent. *Quicksilver.*—Sellers holding off, nominal price £22 per bottle. *Tin.*—Straits tin is quoted about £94. 10/, cash; Banca, £99. 10/; and Australian, £93 per ton. The Cornish smelters have advanced the standard of tin £2 all round. Superior English now stands at about £99; and for fine, £100. Holders are beginning to anticipate improved prices. To day Straits tin very flat; offered at £93. 10, no buyer; Banca, £98 to £100. *Tin Plates.*—Almost all the works in South Wales are once more actively employed, but up to the present time there is no improvement to report in the demand, and manufacturers are very wisely limiting their output."

Messrs. French & Smith (August 21).—"*Copper* maintains its price, but with very small inquiry. *Tin* is quiet. Banca, £99. 10/ to £100 per ton; Billiton, £95; Straits, fine, £93. 10/ to £94. 10/; Straits, afloat or forward, £93. 10/ to £94; Australian ingot, £92. 10/; English refined, £100; English, common bars, in barrels, £98; English, common block, £98; and ingots, £97 per ton. *Tin Plates.*—Charcoal, I. C., 36/ to 41/ per box; coke, I. C., 28/6 to 37/ per box. *Lead* steady. *Quicksilver* is difficult to obtain."

Sandford & Bird's prices current (London, August 15, 1874), has these remarks: "*Tin.*—There has been some more demand lately from consumers, and prices have consequently slightly improved, but there is plenty of metal to meet this demand, and the shipments from Australia are advised as rather heavy. English block and ingot, 96/ per cwt.; bar, 97/ per cwt.; Straits, 94/ per cwt.; Australian, 92/ per cwt. *Tin Plates.*—There is more doing just now, and orders are being given out more freely on United States account. Prices remain steady. Melyn charcoal, I. C., 37/ per box; Afan, I. C., 35/ per box; Cymro, coke, I. C., 29/ per box; best charcoal, I. C., 37/ to 39/ per box; charcoal, I. C., 35/ to 36/ per box; best coke, I. C., 31/ to 35/ per box; coke, I. C., 28/ to 30/ per box; terne plates, I. C., 26/ to 27/ per box; black plate, I. C., 23/ to 25/ per cwt.; charcoal tinned sheets, up to 72x36, 40/ to 44/ per cwt.; coke tinned sheets, up to 72x36, 38/ to 40/ per cwt. Decorated tin plates, 60/ per box of 1 cwt. Continuous terne roofing, 80/ per keg of 200 feet x 20 inches."

Messrs. J. Pitcairn, Campbell & Co.'s fortnightly Liverpool metal report says: "Stocks of Copper (Chilian and Bolivian) in first and second hand, likely to be available, we estimate at: Liverpool, ores, 2119 tons; regulus, 1278 tons; bars, 13,050 tons; ingot, 20 tons. Swansea, ores, 3178 tons; regulus, 9171 tons; bars, 1015 tons; representing about 18,500 tons fine copper, against 18,400 tons 1st instant; against 23,600 tons fine copper 15th August, 1873; against 18,200 tons fine copper 15th August, 1872; against 18,900 tons fine copper 15th August, 1871."

Notes on the Belgian Coke Manufacture.

BY M. AUG. GILLON.*

The carbonization of coal in large mounds has the advantage of not requiring the erection of expensive structures, and calls for nothing but a slight preparation of the surface. It has, however, the disadvantage of necessitating the use of bituminous coal, a great portion of which has to be in lumps. The coke obtained is wanting in uniformity of quality and density, and the yield is comparatively small. Coal, which in well constructed ovens produces from 75 to 80 per cent. of coke, will, by this primitive process, yield but from 60 to 65 per cent. These figures show that the manufacture of coke in mounds is only justifiable where building material is high priced and coal very cheap. As the price of coal rises, so does the necessity for abandoning the whole system, and for adopting the method of carbonizing in special ovens increase. Belgium long since abandoned the old system and adopted the new. In 1852 the extraction of bituminous coal necessary for the manufacture of coke by the means then employed became insufficient in the Charleroi district, and the price increased to such a figure as to threaten serious injury to the iron trade. It was, therefore, found necessary to economize fuel and to find out means for manufacturing coke out of semi-bituminous coal, which circumstances were the means of bringing numerous varieties of ovens under the notice of the industrial community. These problems are such as have a bearing on the nature of the raw material, on the yield, on the quality of the products, on the expenses of labor and on the first cost.

It has always been easy to make good metallurgical coke from bituminous coal, but when the production of this coal became insufficient, it was found indispensable to allow the introduction of inferior coal. This object was attained by a gradual reduction of the width of the ovens, and by calcining the coal in narrow compartments greatly heated externally by the flames of the adjoining ones. Semi-bituminous coal suddenly heated by these flames agglutinates and makes a good coke.

In view of obtaining a larger yield, the coal has been carbonized in close vessels, that is, without the admission of air into the interior of the ovens. In this case the gases distilled from the coal circulate in flues which surround the retort, and are thoroughly burnt within them by means of a well regulated introduction of heated air. The heat developed by the combustion of these waste gases effects a most economical carbonization of coal. The rapidity with which the ovens have been charged, discharged, and the coke extinguished, has also had a favorable influence on the yield.

Uniformity in the coke depends on the dimensions of the oven, and in an arrangement of the flues through which the flames circulate. A certain influence is also attributed to the use of double doors. The solidity of the coke depends principally on the previous crushing of the coal, and on the hight of the charge in the narrow oven. The purity is assured by means of a careful washing out of all extraneous matter from the coal.

Economy in labor has been attained by the substitution of hoppers and tubs, or trolleys, for feeding the oven, instead of the old plan of throwing the coal through the door by means of shovels. Another form of economy consists in the employment of a steam ram for discharging the coke in lieu of hand labor and a hook. The extinguishing is done by means of a hose and nozzle instead of the primitive bucket. With the same object in view, all our most recently constructed coke ovens have been erected on three different levels, the first, or highest, being employed for the circulation of the charging trolleys, the second for discharging the produce of the ovens, and the third is level with the railway, the coke being sent away on it in regular railway trucks direct on to the main line. The level for discharging is immediately above the top of the railway cars to be loaded. The superficial area which is occupied by a number of these furnaces may, in certain cases, become a question of great importance, and in such instances the vertical ovens present very palpable advantages over the horizontal.

It is impossible to give the history of every kind of coke oven in existence, so that we shall limit ourselves now to a description of those in the neighborhood of Liege. We cannot, however, proceed without calling your attention to several interesting kinds employed in the districts of Charleroi and of Mons, which owe their origin to some of our most distinguished engineers, such as MM. Eugene Smits, Martial Fromont, Letoret and Gendebien.

The old forms of ovens, with solid walls, which are known as bakers' ovens, and which are discharged by means of a rabble, many of which are still to be seen in England, have long since disappeared in Belgium, where they have been replaced by ovens having flues, and being emptied by steam-power. The best way of indicating the value of this transformation will be to exhibit at one view the cost of producing coke by the two systems, as was done at some works:

COST OF THE PRODUCTION OF ONE TON OF COKE IN OLD OVEN.

	fr. c.
1538 kilos of coal at 10 fr. 78 c. per 1000 kilos..	16 58
Labor	1 00
Repairs, carriage, &c	0 75
Total cost of 1000 kilos of coke	18 33

COST OF PRODUCING ONE TON OF COKE IN SMET OVEN.

	fr. c.
1330 kilos of coal at 10 fr. 78 c. per 1000 kilos..	14 37
Labor	0 66
Repairs, Carriage, &c	0 85
Total cost of 1000 kilos of coke	15 88

Showing a difference in favor of the Smet oven of 2·45 fr. per ton.

The Smet system, of which we have just spoken, is in existence in this locality at Ougree, at Seraing and at Grivegnee. It is an oven with two doors, and a mechanical ram, which, by-the-by, is universally used in Belgium. The dimensions of this Smet oven are: Length, 7 metres; width, 0·65 metres; hight, 1·60 metres; charge, from 40 to 45 hectolitres; and the time required in making the coke varies from 24 to 36 hours. The coke is introduced through hoppers. The flame from a working oven penetrates into openings at the basis of the arch, and follows two horizontal flues, then it circulates under the sole, and from thence reaches the chimney. When semi-bituminous coal is used, the flames are employed to heat the sole of the adjoining oven rather than the sole of the one in which they were produced.

Modifications have been introduced in the disposition of the flues, so as to avoid the destruction of the brickwork, and also to facilitate the cleaning out of the passages. The blast furnaces of Ougree are working ovens modified in this way by M. Chevaux. M. Gilbert, in order to obtain the same results, has replaced the horizontal flues by vertical chimneys in several different works in the province of Hainaut.

The Smet oven, after being very successful both in this country and also in others, seems in course of being superseded by other systems, and more especially by the Dulait ovens, by the Coppee ovens, and by the Appolt ovens, all of which we shall describe.

In a group of ovens on the Dulait system, the ovens are placed in pairs—one oven heating the adjoining one. This division in couples exists also in the Coppee system. It allows of the extinction at will of any portion of a group of ovens, while the remainder are kept in full operation. The flames descend directly below the sole, where they are divided into four currents, which flow in between the partition walls, and after traversing every flue they reach the chimney. Their length is 7 metres; width, 0·75 metres generally, but is variable according to the quality of the coal; the hight to the base of the arch is 1·15 metres; the hight of the arch 0·10 metres; and the incline of the sole toward the discharging level is 0·02 m. per metre. In order to avoid waste of heat as well as the action of the winds and of the penetration of air, these ovens are furnished with double doors, the interior doors being of cast iron, the outside doors level with the face of the structure, at a distance of 0·30 m. from the preceding ones. The outer doors are of sheet iron, of a thickness of 0·005 metres. The disposition of these doors reduces the space really occupied by the coal in the furnace to a length of 6 metres. Carbonization in a close vessel is one of the principles on which the Dulait system is based, in consequence of which, all the doors are carefully closed all round with clay. The hoppers for charging the ovens are also closed both at the top and bottom, the lower part being shut in by a cast iron slab cemented with clay on the brickwork, and the upper portion has a cover, the edges of which rest in a channel filled with powdered coal.

The carbonization in a close vessel gives a maximum yield. But if air is excluded from the oven and does not consume a portion of the coal during combustion, we, however, must be able to obtain the heat necessary for the coking operation. M. Dulait, following out the idea already put forward in England by Mr. Cox, has attained the desired result by burning the gases in the circulating flues by means of the introduction into these flues of numerous jets of heated air. In order to provide for this, one of the walls of the flues through which the gases pass is built of two rows of hollow bricks, superposed. These bricks have a section of 0·10 metres by 0·12 metres. They are pierced by a longitudinal hole 0·05 metres in diameter, in such a manner that, by their juxtaposition, they form two superimposed channels as long as the whole flue. The lower channel is open at the front of the oven and closed at the other extremity, where it rises in order to communicate with the upper parallel channel. This is pierced by holes 0·008 metres in diameter, placed at a distance of 1 decimetre from each other, and opening into the flue in which the combustible gases are circulating. By this arrangement the external air taken in by the draught penetrates into the lower channel, where it gets heated, and, reaching the upper passage, is projected across the stream divided into innumerable streamlets, which increase the surface of contact, thus effecting perfect combustion of the gases, and producing the highest possible degree of temperature, so that the gases are in this way fully utilized. As a result, if the coal is of the right quality, the combustible gases are produced in sufficient quantity to admit of the complete distillation of the coal, and the heating of the whole of the apparatus in a regular and permanent manner.

This system does away with the necessity for providing openings for draught, or reduces it to a theoretical absence of draught, limited only by the care with which the clay has been applied to the doors.

The Dulait system has been very much discussed and criticised. Many unfavorable opinions have been expressed in regard to it. Some persons claim for it a marked superiority over all others, while other parties, although recognizing the ingenious disposition of the parts, do not think it can be employed in the case of bituminous coal. Some again, after practical experience, remain undecided as to its value when the first cost is taken into consideration.

At the John Cockerill Works, at Seraing, these ovens have been discarded, the engineers in that locality believing that the bituminous coal of that region produces a denser and harder coke in the ordinary ovens, which are put up at only half the expense. At the establishments of the Societe de Witry, at Ougree, one group of Dulait and another of Smet ovens have been built side by side for the purpose of comparing their working. The dimensions of the Dulait ovens are: Length, 7 metres, 6 of which are occupied by the charge of coal; width, 0·74 metres. The charge is 2200 kilos., and the operation lasts 24 hours, the yield being 78 per cent. The dimensions of the Smet ovens are: Length, 7 metres, entirely occupied by coal; width, 0·68 metres. The charge is 2000 kilos. and the operation lasts 24 hours, the yield being 77 per cent. The first named furnace gives off much less smoke than the second, and although the Dulait apparatus costs considerably more to erect, and is less easy to manage than the other, the Societe have decided, after examining the subject in all its bearings, to adopt it in their establishment.

M. Dulait has constructed, in the different coal districts of Belgium, no fewer than 1100 of his ovens, and 700 in France, Prussia and Austria.

The Coppee ovens are very highly thought of at the present time. Belgium possesses 524 of these in operation—several in the neighborhood of Liege—and 192 others are being built. In Prussia, 1305 are at work, and 138 are in course of erection In France 186 are in activity, and in England 30 are at work at the Coppee Coke Company's works, at Thorncliffe, and 30 more are being put up there.

As in the systems previously described, the Coppee ovens are placed together in groups of two and two. The flames from the two ovens of the same group pass through a series of openings made in the arch, and circulate through suitable channels around the oven, then passing beneath the sole of the adjacent oven, enter a common conduit, which first goes beneath the boilers and then leads to the chimney. The gases are burnt in the channels by numerous jets of warm air. Galleries under the brickwork are traversed by currents of cold air, which cool and preserve the construction. To diminish the loss of heat, the tops of the ovens are covered with a bed of clay about 18 in. thick, on which bricks are laid.

The ordinary dimensions of an oven are: Length, 9 m.; width, 0·45 m.; hight, 1·20 m., for a coking of 24 hours. For a coking of 48 hours the width is 0·60 m., and the hight, 1·70 m.

The ovens are quickly filled by three charging hoppers.

The characteristics of the Coppee furnaces are:

1. A small width, and an arrangement of channels especially suited for poor coals.

2. A combustion of gas by a double admission of air, which entirely suppresses the smoke.

3. The combination of all the hot gases in a large conduit beneath the ovens, and their utilization for heating boilers.

It is estimated that a furnace can heat a 3 or 4 horse boiler. This force is employed for breaking the coal, discharging the coke, &c. A furnace gives 2 tons of coke per 24 hours. The duty is high, and the quality of coke produced extremely good. A furnace, including foundation, to a depth of 1·85 m. below the ground level, costs 2500 francs. A group of 26 ovens, including breakers, discharging apparatus, wagons, distribution of water, boilers, &c., costs 106,000 francs.

It has been urged that the Coppee ovens are too light on account of the side walls, which are only 0·33 m. thick, including a space 0·09 m. for the passage of gas, but, from the experience obtained, we may safely assert that this criticism is entirely an unjust one.

Comparative experiments made in England with the elliptical beehive ovens and the Coppee furnaces gave the following results, which we extract from the paper of Mr. Bainbridge:

Summary showing Chief Points of Comparison between the Beehive and the Coppee Ovens.

	Common oven.	Coppee oven.
1. First cost per 2 tons of coke per day	£119. 7/.	£100.
2. Time burning	48 to 120 hours.	24 hours.
3. Area occupied per ton of coke per day	1218 sq. ft.	234 sq. ft.
4. Per cent. of yield. { Washed	45 ℔ cent.	59 ℔ cent.
{ Unwashed	54 "	68 "
5. Area of outside cooling surface per 2 tons of coke per day	1002 sq. ft.	175 sq. ft.
6. Time occupied in emptying and refilling	60 minutes.	8 minutes.
7. Units of heat in waste gases given off per oven per day	966,710.	1,401,584.
8. Labor charges (cost of coking) per ton	1/3,	11d.

The arrangements for charging and emptying show, also, a marked improvement in the yield, but M. Appolt, in placing the retorts vertically, and effecting the filling and emptying by gravity, appears to have made the greatest improvement possible in this detail. At Ougree, and at Seraing, several groups of ovens are built on this system.

An Appolt group comprises 12, 18, or 24 retorts, ranged in two lines. Each retort is from 4 m. to 5 m. high. To facilitate the exit of the coke the retorts are made to taper, so that at the top they measure 1·10 m. by 0·35 m., and at the bottom 1·25 m. by 0·45 m. The bottom of the retort is closed during the coking by a sliding door. The charge is made first with coke dust, with which a bed about 0·30 m. thick is formed. The charging wagon is then brought over the mouth of the retort and the load is emptied. The mouth is closed with bricks and luted with clay, so that the charge is thus hermetically sealed.

By the heat applied at the sides the gases are distilled, and escape by small openings, 0·15 m. by 0·02 m. high, and placed 0·40 m. from the bottom. The gases are discharged into an annular space around the compartment, in which they are burnt, with air introduced through openings in the furnace. The heat developed by their combustion effects the carbonization of the coal. The products of combustion reach the chimney by means of twelve horizontal channels, fitted with valves and arranged in such a manner as to distribute the heat equally over the whole group. To discharge the retorts, the door is opened, and the cake of coke falls into a wagon lined with fire bricks. The coke is quenched by water.

The advantages which have been sought for in this construction are as follows:

1. The calcination is effected in a close chamber solely by the combustion of gas disengaged from the coal, a condition favorable to a high yield.

2. The heating surface is very considerable, reaching 190 square metres for a charge of 1·5 tons. The comparatively small size of the retort secures a rapid and regular carbonization.

3. The flames from all the compartments, uniting in a common chamber, which surrounds them, insure a uniformity of temperature.

4. The vertical position of the compartments, beside the facility for rapid charging and emptying, gives more compactness to the coke, while the arrangement occupies less space.

The following are the inconveniences incident to the system:

1. If the general arrangement does not allow of the coal being led direct out upon the loading platform, lifts must be provided to raise it.

2. Masses sometimes adhere to the sides of the retorts, which have to be broken by bars before the coke can fall.

3. The management of these ovens is not so simple as in some other systems, and when repairs are required for one compartment, the whole group has to be stopped.

At the works of Marihaye and Seraing, the compartments are 4·5 m. in hight, of which from 3·20 to 3·40 are occupied by the charge; the upper opening measures 1·12 m. by 0·29 m., and the lower one 1·25 m. by 0·43 m. This charge is composed, beside 115 kilos of coke cinders thrown in first, of 1·2 tons of dry coal. The Marihaye coal, previously washed, is calcined in these ovens; 1 ton of gross coal gives ·890 tons of washed coal, ·095 ton of stones, and ·015 of dust. The time for coking is 24 or 26 hours. The percentage obtained is 78 per cent. with dry coal, and this rises up even to 80 per cent. The coke from these ovens is of a remarkable compactness and hardness, and is well suited for transport. Whilst ordinary coke weighs from 450 to 500 kilos. the cube metre, the coke at Seraing, made in the Appolt furnace, weighs 530 kilos. and sometimes 560 kilos. For a complete works we can estimate the comparative cost of establishment per ton of coke, not washed, produced in 24 hours:

System.	Francs.
Coppee	2,500
Smet	3,000
Appolt	5,000

On the other hand, the Coppee furnaces occupy double the area, and the Smet two-and one-half times the area of the Appolt ovens, for an equal production.

British Coal and Iron Prospects.

The London *Mining Journal* says:

That a sudden and great increase in the price of any of the great staples is not productive of a healthy state of trade we have the strongest possible evidence in the Board of Trade returns just issued, showing the exports from the United Kingdom for the year up to the end of July. This is especially the case with respect to coal and plain and manufactured iron. Coal reached the highest price ever known during the first quarter of 1873, and the exports during the first seven months of that year were only 7,200,532 tons, against 7,610,313 tons during the same period of 1872, whilst up to the close of last July the quantity was 7,474,195 tons. The falling off in most instances has been to those countries who have not only been our largest customers, but have vast stores of coal now in process of development. Germany, in particular, shows a marked decline as a purchaser, and is now busily engaged in tapping her own stores, so that our exports to that country are not likely to increase. The Saarbruck coal field is about the most important in Western Europe, having an area of upward of 900 square miles, whilst in the northern part of the empire there are also vast fields of coal, some of them now being worked, so that Germany will be in a position, before many years have elapsed, to be entirely independent of England for supplies of fuel. France, too, is paying more attention to her own deposits of coal than she has ever done before, and the government is stimulating the production as far as it can, so that it is not surprising to find that less coal was sent there during the last seven months than during the same periods of 1872 and 1873. Russia, also, is now engaged in opening out the immense coal fields to be found in that vast country, to which machinery for the purpose is now being sent from England, and has taken less from us of late than she did in 1872. Beside the opening out of the minerals in the countries to which we have alluded, discoveries of new coal fields are constantly being made, one of the most recent, in the West Indies, having just been brought to light.

But the high prices of 1873, it may be said, not only led to the decline of our exports of coal, but also to a great many of our capitalists investing in mineral property, so that more collieries were commenced last year in almost every mining district in the kingdom than was the case during the previous five or six years. In Yorkshire alone the number was close upon 130, which would show an increase of productive power of about 25 per cent. on that of the year 1872. But we are now experiencing a most decided reaction, for our output is in excess of all our requirements, and will be very much more so in the course of another year or two, when the many new collieries now being sunk are completed. Prices will, consequently, have to come down considerably, and wages as well.

As might be expected from the close relationship that coal bears to iron and steel, our exports of the latter show a marked falling off during the present year. In pig and puddled iron the decline is most marked, not having been half of what it was for the same months of 1872. Germany, Holland, Belgium and France, all have taken less than in 1872, particularly the former, the quantity sent there during the last seven months having been only 76,135 tons, against 168,753 tons for the corresponding period of 1872, and 175,461 tons in 1873. The exports of railway iron have been very fairly maintained, although not quite equal to what they were in 1872. Russia, however, has taken an unusually large quantity, being actively engaged in completing many new lines that will aid materially in the development of the great mineral wealth which belongs to her. But whilst to most parts of Europe an increased tonnage of railway material has been sent during 1874, as compared with previous years, the United States shows an extraordinary falling off. Taking the first seven months of 1872 and 1873, with the same period of the present year, the respective quantities sent to the States were 300,316 tons, 134,993 tons, and 72,631 tons. From our own reports of the Sheffield trades it will be naturally expected that our exports of hardware and cutlery have decreased, which it has done considerably, particularly to the United States, Germany and France.

Looking at the declared value of our exports it would appear as if the price of coal has been better maintained abroad than at home. Taking the seven months ending in July last we find the average value to be about 18/5 per ton, against 21/2 per ton for the same period of 1873, and 12/8 for 1872. It will then be seen that high prices have been followed by a reduction in the demand. Still there is now every appearance that with a superabundance of coal at a moderate cost a considerable impetus before long will be given to the iron and other trades in which the price of fuel plays a most important part.

Chinese Polytechnic Institute.—Mr. Walter Medhurst, British Consul at Shanghai, is endeavoring to secure the establishment in that city of an institution intended to introduce to the Chinese a knowledge of the arts and productions of western nations. The present is a new epoch in the history of China, which, like Japan, has begun to move in the direction of scientific progress, and is manifesting a desire to avail itself of the skill and resources of other countries. As, however, the population of China is ten times greater than that of Japan, and is reputed to be equal to the whole of the rest of the human race, the new opportunities afforded by the opening to industrial enterprise of so vast and promising a field will be correspondingly numerous and important. The institution will, to some extent, be comparable to the international exhibitions of Europe, since it will afford manufacturers of every class an opportunity of exhibiting such of their wares as they may wish to introduce to the Chinese market; and many articles now unknown there require only to be brought to the knowledge of the Chinese people to command a wide and increasing currency.

The Strike at Fountain Mills.—The puddlers at Fountain Mills, near Connellsville, Pa., are on a strike against the payment of half their wages in scrip. They complain that they cannot use the scrip, except in the company's store, that the charges are far in excess of the prices elsewhere, and that they have to pay a large percentage to get their scrip changed to greenbacks, even at the company's office. The firm have offered a compromise of this kind: Half the wages to be paid in cash on pay day, the other half to be paid in sixty days. So far the puddlers have refused this offer, but the sheet rollers have accepted it.

A few days ago Mr. James W. Bennett, of this city, a Custom House employe, saw a number of laborers engaged in digging a foundation on the northwest corner of Washington and North Moore streets, three blocks from the public stores. As Mr. Bennett is an old miner, having been engaged in mining enterprises, principally connected with the iron interest, for more than thirty years of his life, he was attracted by the appearance and the color of the substance that was being carted away from the excavation. Upon a close examination he discovered that the laborers had struck a rich vein of hematite iron ore, worth, at least, six or seven dollars per ton. The vein, which is thirty feet wide, was found at a depth of four feet from the surface. Its depth is as yet unknown, for when Mr. Bennett saw it the workmen had only penetrated to the depth of three feet. Mr. Bennett said that he had frequently heard it stated that no mineral deposit of any kind had ever been discovered on Manhattan Island, and he was consequently much surprised at finding one in the heart of the city. He secured a number of specimens of the ore.

W. W. Scranton, son of the late J. H. Scranton, has been appointed general manager of the Lackawanna Iron and Coal Company, Scranton, Pa.

London Metal Market.

(From The Mining Journal.)

	£.	s.	d.	£.	s.	d.
Copper—℔ ton.						
Best Selected	86	0	0	87	0	0
Tough Cake & Tile	83	0	0	85	0	0
Sheathing and Sheets	90	0	0	92	0	0
Bolts	96	0	0	98	0	0
Bottoms	93	0	0	95	0	0
Old	90	0	0	85	0	0
Australian	86	0	0	88	0	0
Wire ℔ ℔.	0	1	0¾		—	
Tubes "	0	1	0¾	0	1	1
Brass—℔ ℔.						
Sheets	0	0	10	0	0	11
Wire	0	0	10¾	0	0	11
Tubes	0	0	11	0	0	12
Yellow Metal Sheathing	0	0	8	0	0	8¼
Sheets	0	0	7¾			8
Spelter—℔ ton.						
Foreign on the spot	22	5	0	22	10	0
" to arrive	22	7	6		—	
Zinc—℔ ton.						
In Sheets	25	10	0	28	15	0
Quicksilver—℔ bottle.	22	0	0		—	
Tin—℔ ton.						
English Blocks	98	0	0		—	
Ditto Bars (in bris.)	99	0	0		—	
Ditto Refined	97	0	0	98	0	0
Banca	100	0	0	101	0	0
Straits	93	0	0	94	0	0
Australian	91	0	0	92	0	0
* **Tin Plates**—† ℔ box.						
IC Charcoal	1 qual.	1	16	0	nom.	
IX "	1 qual.	2	0	0	"	
IC "	2 qual.	1	15	0	"	
IX "	2 qual.	2	1	0	"	
IC Coke		1	8	0	1	12	0
IX "		1	14	0	1	16	0
Canada Plates ℔ ton.		19	0	0		—	
" at works		18	10	0		—	
Iron—℔ ton.						
Bars Welsh, in London		9	5	0	9	10	0
" to arrive		9	0	0	9	5	0
Nail Rods		10	15	0	11	10	0
Nail Rods, Staff'd in L'ndon		11	0	0		—	
Bars "		11	0	0	14	0	0
Hoops		12	0	0	13	0	0
Bars at Works		10	0	0	11	0	0
Hoops ditto		11	0	0	14	0	0
Sheets, single, and plates		12	0	0	15	0	0
Pig, No. 1, in Wales		5	0	0	6	10	0
Refined metal ditto		7	0	0	8	0	0
Bars, common ditto		8	10	0		—	
Do, merchant, Tyne or Tees		9	0	0		—	
Ditto, Railway, in Wales		7	0	0	8	0	0
Ditto, Swedish, in London		17	0	0	18	0	0
To arrive		17	0	0	18	0	0
Pig, No. 1, in Clyde		3	15	0	4	5	0
Ditto, f.o.b., Tyne or Tees		4	11	0	5	15	0
Ditto, Nos. 3, 4, f.o.b.		4	10	0	5	10	0
Railway Chairs		5	0	0	5	5	0
" Spikes		12	10	0	14	0	0
Indian Ch'coal Pigs in L'don		10	0	0	13	0	0
Steel—℔ ton.						
Swedish, in kegs (rolled)			—			—
Ditto (hammered)		19	10	0	20	0	0
Ditto, in fagots		21	0	0		—	
English, spring		23	0	0	25	0	0
Lead—℔ ton.						
English Pig, common		21	5	0	21	10	0
Ditto, LB		21	5	0	21	7	6
Ditto, WB		21	15	0	22	0	0
Ditto, Sheet		22	10	0		—	
Ditto, Red Lead		23	0	0		—	
Ditto, White		20	0	0	22	0	0
Ditto, Patent Shot		25	0	0	25	10	0
Spanish		21	0	0	21	2	6

* At the works 1s. to 1s. 6d. per ton less. Terne plates 3s. per box below tin plates of similar brand.
† Add 6s. for each X.

* Professor at the School of Mines, Liege, Belgium.

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The Best

Cheap Pistol Made.

Send at once for a new

ILLUSTRATED CATALOGUE,

The most complete ever published, containing Cuts and Prices of

Breech and Muzzle Loading Guns, Rifles, Pistols, Flasks, Pouches, Gun Material, Ammunition, Key Blanks, &c.

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Inquiries must be written on paper with business heading, or business card enclosed.

MILLERS FALLS COMPANY, No. 78 Beekman Street, New York,

BARBER RATCHET BRACE.

This Brace has a **Lignumvitæ Head, Rosedale, Wrought Iron Sweep, Malleable Iron Nut & Socket,** with

Cast Steel Jaws,

It is beautifully finished, and in

MOST PERFECT BRACE

In places where there is not room to revolve the sweep, a will drive the bit in or out. They cost only 50 cents more without the Ratchet attachment, and will surely come

Pawls and Rachet Wheel.

all respects the **IN MARKET.**

slight back and forth motion than the same style of brace into general use.

For Sale by all Hardware Dealers.

Miller's Falls Co.,

No. 78 Beekman St.,

NEW YORK.

IRON CUTTERS.

This is the most powerful Cutter in use, and just what is needed by all retail iron dealers. Also by shipbuilders, manufacturers, and all others having iron to cut. It will cut iron twice as large as any other machine of the same cost.

Weight.	Cuts.	Price.
No. 1, 16 lbs.,	⅝x2 in., or ½ in. round or sq.	$25
No. 2, 165 lbs.,	⅝x3 in., or ⅝ in. " "	50
No. 3, 312 lbs.,	6-8x4 in., or 4-4 in. " "	75

GLASS CUTTERS.

Our Glass Cutters are made with a handle like a Glaziers Diamond, but, instead of the diamond point, they have a small hardened steel revolving wheel, the sharp edge of which cuts nearly as well as a diamond. They are durable, and will give entire satisfaction.

WITH THIS

BRACKET SAW

An infinite number of useful and ornamental articles can be made. It will pay for itself every day when in use. The frame is 5x12 in., and made of red cherry wood, beautifully polished.

For sale at all Hardware stores.

Millers Falls Co.,

78 Beekman St., N. Y.

In addition to the 20 Cast Steel Tools inclosed in this handle, it will hold anything from an 8 inch Mill File to a Cambric Needle. It is by far the best Tool Holder in use, and will also answer nearly all the purposes of a Hand Vise. The wood is lignumvitæ and hard maple, the ferrule, malleable iron, and the jaws cast steel. Most hardware dealers keep them, or will send to us for them.

MILLERS FALLS CO, 73 Beekman St., N. Y.

Manufacture **Barber's Bit Braces, Miller's Falls Vises, Little Giant Iron Cutters, Adjustable Chuck Breast Drills, Family Tool Chests, Pratt's Boiler Tube Scrapers, Patent Angular and Ratchet Drilling Machines, Langdon Mitre Boxes.**

HOWARD PARALLEL BENCH VISE.

MANUFACTURED BY

Howard Iron Works,

Send for price list. Buffalo, N. Y.

RUSSELL & ERWIN MFG. CO., New York and Philadelphia, Agents.

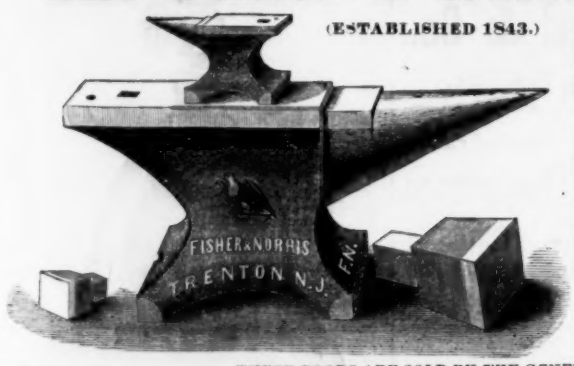
NOTICE.

These **Vises** are only manufactured at the **HOWARD IRON WORKS,** at **Buffalo, N. Y.** and are so stamped. The improvements in these **Vises** which are patented are valuable, and parties who claim to manufacture, and are offering a **Vise** representing it to be the same as the **HOWARD VISE,** are deceiving the Trade.

HOWARD IRON WORKS.

The Fisher & Norris Eagle Anvil Works.

(ESTABLISHED 1843.)



These Anvils are manufactured at the oldest Anvil Factory in this country. They are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils, after a time, become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvils being of crystallized iron, no such settling can ever occur; and the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more *solid* material, and consequently with less rebound, the piece being forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as with a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one-fifth lighter* than that required when using a wrought iron anvil which is more elastic.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, after being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely of steel.* The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is *warranted to be thoroughly welded and not to come off.*

REDUCED PRICE LIST. ANVILS weighing 100 lbs. to 800 lbs., 11c. per lb.

Smaller Anvils, ("Minims.")

	No. 0	1	2	3	4	5	6	7	8	9
Weighing about 10 lb.		15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
Price,	$3·50	$4·25	$5·00	$5·50	$6·50	$7·50	$8·00	$9·00	$10·00	$10·50

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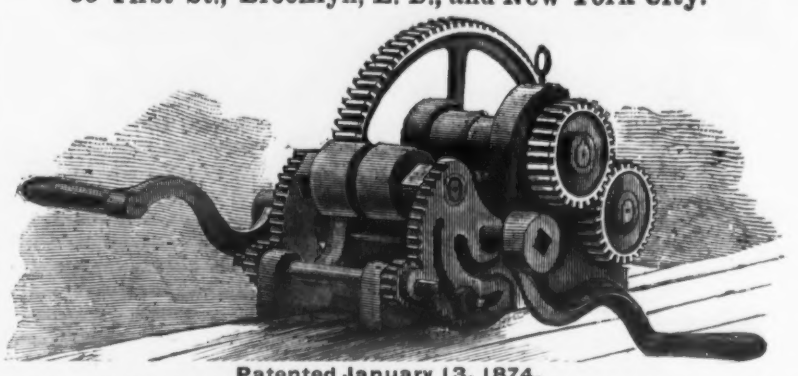

Patented January 13, 1874.

This Machine is destined to supersede all Tire Benders now in use, especially for heavy work. The middle roller can be readily removed and readjusted, thus allowing Tires to be withdrawn without difficulty after being bent. Fifth Wheels and Tires never slip while being bent in this Machine. One man can bend a Tire 3x1 without difficulty.

Manufacture Carriage Materials, Axles, Springs, Blacksmiths' Supplies, Bolts, Wood Work, Trimmings, &c.

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The Celebrated DUBUQUE.

Acknowledged by all to be the

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Standard Soft Coal Burner of the West.

The Manufacturers have made it a specialty for the past six years. It is guaranteed in every respect to be a perfect Soft Coal Burner and without a rival. Send for Samples and Catalogue to

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Are now prepared to furnish a *very superior quality of Genuine Corundum,* from the *Unionville Mine, Chester County, Pa.,* which is the largest known deposit of Corundum in the world. It is harder than Emery or any other known Mineral except the *"Diamond,"* and superior in its cutting qualities for the polishing or cutting of steel, iron or other hard substances for which Emery has been used.

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Backus's Patent Bit Brace

AND

Angular Extension BORER.

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ANGULAR EXTENSION BORER.

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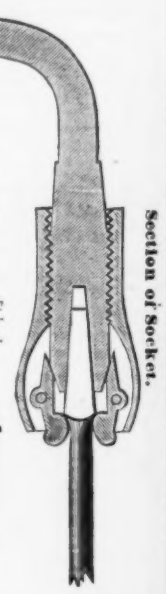
Extension Borer.

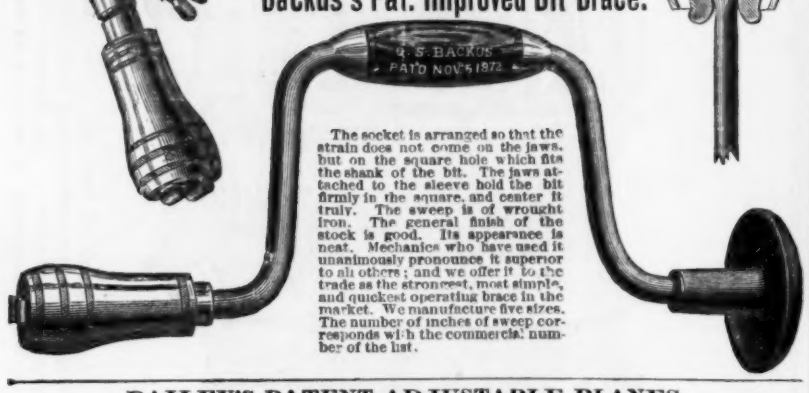


Section of Socket.

This tool can be used in any brace, at any angle, and also for straight work. Is the best and most convenient tool of its kind ever offered to the public. Eight thousand sold the first year.

Also Manufactures the Straight Extension

Backus's Pat. Improved Bit Brace.



The socket is arranged so that the strain does not come on the jaws, but on the square hole which fits the shank of the bit. The jaws attached to the sleeve hold the bit firmly in the square, and center it truly. The sweep is of wrought iron. The general finish of the stock is good. Its appearance is neat. Mechanics who have used it unanimously pronounce it superior to all others; and we offer it to the trade as the strongest, most simple, and quickest operating brace in the market. We manufacture five sizes. The number of inches of sweep corresponds with the commercial number of the list.

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IRON AND WOOD. Thirty different styles in 70,000 ALREADY IN USE.

Smooth Planes,
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Fore Planes,
Jointer Planes,
Block Planes,
Rabbet Planes,
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Carpenters,
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All Use them.

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Carriage Bolts	Elastic Base Knobs,	Box Hooks,	Nail Sets,
Machine Bolts	Steak Hammers,	Box Chisels,	Cork Screws,
Plow Bolts	Boxwood Rules,	Tobacco Needles,	Ice Awls,
Stove Bolts,	Ivory Rules,	Table Nut Cracks,	Ice Axes,
Elevator Bolts	Plumbs and Levels,	Hasps and Staples,	Tinned Meat Hooks,
Tire Bolts,	Adjustable Plumbs and Levels,	Ox Bow Pins,	Can Openers,
Fancy Bolts,		Bull Rings,	Patent Boot Jacks,
Bolt Ends,	Pocket Levels,	Cattle Leaders,	Wood Handle Cover
Coach Screws,	Wagon Jacks,	Boxwood Wheel Pulleys,	Sash Lifters,
Turn Buckles,	Axle Clips,		Hickory Bung Starts,
Blacksmiths' Hammers,	Saddle Clips,	Coopers' Rivets,	Lignumvitæ Mallets,
Riveting Hammers,	Fifth Wheels,	Carriage Rivets,	Tin Spoons,
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FOR HIGH & LOW PRESSURE STEAM HEATING APPARATUS FOR ALL CLASSES OF BUILDINGS.

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BRASS VALVES, COCKS, TOOLS, &C.,

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FOR WATER AND GAS.

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SELF-ADJUSTING PIPE WRENCH.

Forged from Best Tool Steel.

The dog is solid over the head of the lever bar, taking the strain off from the pin.

Each Wrench takes four Sizes of Pipe.

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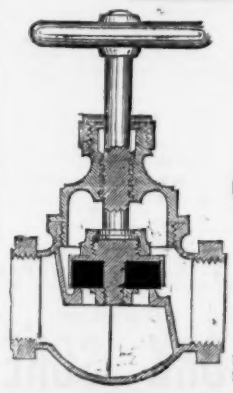
Manufacturers of

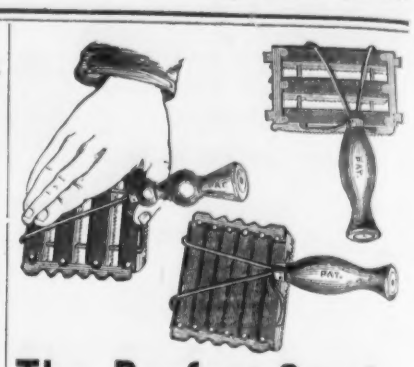


Jenkins' Patent Compression Valves AND Gauge Cocks

Also,

Nelson's Patent LUBRICATOR.

Warranted the most reliable and durable in the country.



The Perfect Comb.

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb*. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

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THE CHARLES GREGG MANUFACTURING CO.

BRASS WORK of all kinds,

FITTINGS FOR

Steam, Gas and Water

PLAIN AND GALVANIZED

WROUGHT IRON PIPE,

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Business Established, 1836. Incorporated, 1872

Send for Price List.

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Manufacturers of Plain and Galvanized

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For

Gas, Steam, Water, Oil, &c.,

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Pipe of any Size, Length or Thickness furnished to order.

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Pumps, Water Closets, Fountains, Vases, &c.

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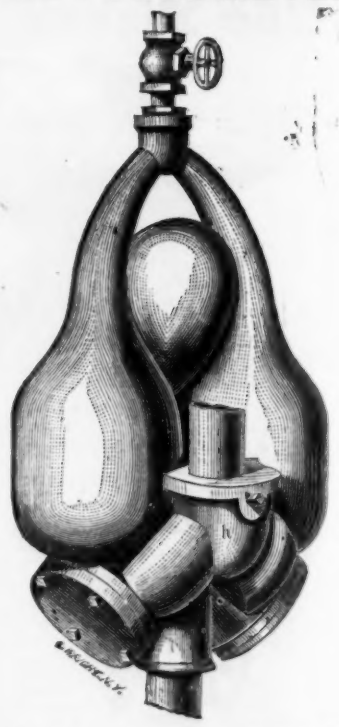

The simplest, most durable and effective Steam Pump now in use. With pump gritty or muddy water, without wear or injury to its parts. It cannot get out of order.

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811 & 813 North Second St., St. Louis, Mo.

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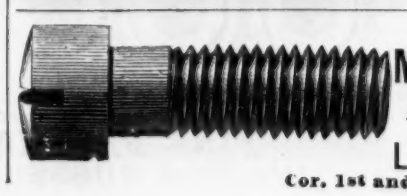

TURNED MACHINE SCREWS,

One-sixteenth to five-eighths diameter. Heads and points to sample.

IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

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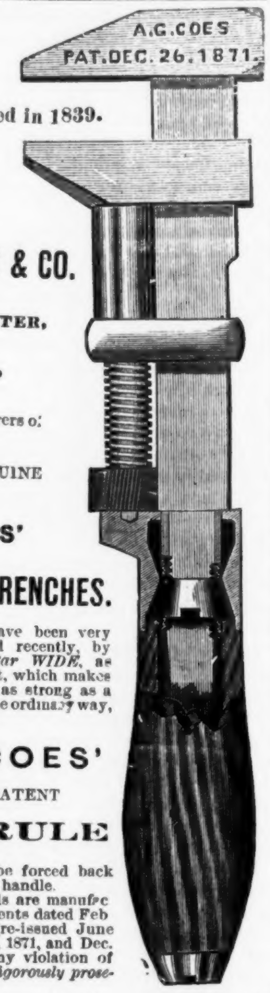
and Index to Advertisements.



Established in 1839.

A. G. COES & CO.

WORCESTER, Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle.

☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

SWAN & BROMBACHER,
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Manufacturers and Dealers in
Mechanics' Tools,
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a specialty.
Price lists on application.

GEM
Water Meter.

We would beg to call attention to our new Improved Gem Meter, which is not only adapted to measuring *Water*, but it can be also used for *other Fluids with confidence*

Our present facilities are such that, with new and Improved Machinery, we can fill orders promptly for all sizes on the list.

Should any Water Department feel desirous of testing our **GEM METER**, by actual use with other patents, we will furnish one for that purpose, to be thoroughly tested for two months, when it can be either paid for or returned to us at our expense, if not found satisfactory.

National Meter Co.,
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95 John Street, New York.

☞ A pamphlet entitled, *"Justice & Economy in Public Water Supplies,"* sent on application.

Fire Brick.

B. KREISCHER & SON.,
New York Fire Brick &
STATEN ISLAND
CLAY RETORT WORKS,
Established 1845.
Office, 58 Goerck Street, cor. Delancy Street
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The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.

Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island by the cargo or otherwise.

Watson Fire Brick Manufactory,
ESTABLISHED 1836.
JOHN R. WATSON, Perth Amboy New Jersey
Manufacturer of
FIRE BRICK,
For Rolling Mills, Blast Furnaces, Foundries Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.
FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE

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Manufacturers of all shapes and sizes of **FIRE BRICK** for Founaries, Rolling Mills, Blast Furnaces, Stove Works, Lime Kilns, &c. A full stock of McKenzie and other Cupolas. Also Fire Clays and Sand constantly on hand. Shipments made at the shortest notice. Send for Circular.

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NEWTON & COMPANY.
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ADAM NEWKUMET,
1537 & 1539 N. Front St., Phila., Pa.,
For Steel, Brass, Nickel, Copper, Bronze, &c.
Equal to any in the market, and all guaranteed.
☞ Keeping a full stock of all sizes on hand, and being confident of giving *entire satisfaction* we respectfully ask consumers to give us a trial.

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ESTABLISHED 1846.
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FIRE BRICK
of reliable quality for all purposes, manufactured of the best New Jersey Fire Clays. Also, ROCKINGHAM WARE, YELLOW WARE. Fire Clay, Fire Sand, Kaolin, Ground Fire Brick, and Dinantine Building Brick.

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PHILIP NEWKUMET,
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manufactures 9 inch Fire Bricks, Tiles, and Blocks for Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Glass Houses, &c., &c
Articles of every description made to order at short notice, and in a very superior manner.
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BRICK PRESSES,
For Fire and Red Brick.
PATENT STEAM GEARING
For grinding Clay for Red or Fire Brick, and all kinds of **Brick Machines** in general.
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Oldest and Largest Establishment of the kind in the U. S.
F. L. & D. R. CARNELL,
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Manufacturers of Pennsylvania Brick Machine, Little Giant Pipe Machine, Fire and Red Brick Presses, Clay Wheels, Tile Machines, Stampers, Grinding Pans. Brick Yards fitted out for running by steam or horse. Heavy and Light Castings. Send for circular.

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Patent Law.

As our readers represent a very large class of inventors and manufacturers interested in patents and patent law, we publish the following abstract from a very interesting "Manual of Patent Law," by Wm. Edgar Simonds, of Hartford, Conn., which will be found to contain much valuable information:

THE NATURE OF A PATENT PRIVILEGE.

A great majority of inventors believe they have a natural right to their inventions, of the same kind given by statute, irrespective of the actual passage of the law.

Such is not the fact. The right to the exclusive use of an invention is not a natural right. When it exists at all, it is a civil right only. An inventor has no right to his invention at common law. He has no right of property in it originally. The right which he derives is a creature of the statute and of grant, and is subject to certain conditions, incorporated in the statutes and the grants. If to-day you should invent an art, a process, or a machine, you have no right at common law, nor any absolute right to hold that for seven, ten, fourteen, or any given number of years, against one who should invent or adopt it to-morrow, and thus cut him and everybody else off from the right to do to-morrow what you have done to-day.

The policy of the Patent Law is primarily a selfish one on the part of the public, and only secondarily intended for the benefit of inventors, and then as a means to an end only. The theory of the law is, that the promotion of science and of the useful arts is of great benefit to society at large, and that such promotion can only be attained by securing to inventors and authors, for limited times, the exclusive right to their inventions and writings.

The patent laws promote the progress of the useful arts in at least two ways: First, by stimulating inventors to constant and persistent effort, in the hope of producing some financially valuable invention; and, second, by protecting the investment of capital in the working and development of a new invention from interference and competition till the investment becomes remunerative.

A patent is a contract between the inventor and the government representing the public at large. The consideration moving from the inventor is the production of a new and useful thing, and the giving to the public a full knowledge thereof, by means of a proper application for a patent, whereby the public is enabled to practice the invention when the patent expires. The consideration moving from the government is the grant of an exclusive right for a limited time, and this grant the government protects and enforces through its courts.

The method followed by the United States in the granting of patents is probably the best in the world, and never ought to be materially changed. But one or two other countries make any examination at all into the novelty of an alleged invention presented as subject matter for a patent, and by none of them is that thorough and systematic examination made that is had here. The small sum of money paid by an applicant for a patent is not really in the nature of a fee; it is money paid for the services of trained experts, kept to examine into the novelty of alleged inventions, and to prevent inventors from going away with clearly invalid patents. Were it not for this governmental examination no one would buy a patent, or risk any capital in working under it, except after a thorough and expensive search and vindication by a private professional expert.

PATENTABLE SUBJECT-MATTER.

The statute provides: "That any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, and not in public use or on sale for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the duty required by law, and other due proceedings had, obtain a patent therefor."

The words "invented" and "discovered" are, for the purposes of the patent law, practically synonymous.

It may be observed, first, that an invention for which a patent is sought must be original with the applicant. Some countries, notably Great Britain, allow the first introducer of an invention to take a patent therefor, holding such an introducer to be the first inventor within the realm. Under the law of the United States, the applicant must be really an inventor—the invention must be original with him. Although the statute specifies "any person," this is construed to permit joint inventors, no matter how many in number, to apply for and take a patent. Minors can apply as well as adults.

The inventions specified as patentable are:

1. An art or an improvement of an art.
2. A machine or an improvement of a machine.
3. A manufacture or an improvement of a manufacture.
4. A composition of matter or an improvement thereof.

An art, in the sense of the patent law, is nearly or quite the same thing as a process; a patent for an art is for a way or manner of doing something in distinction from tangible means made use of in the process. That which is substantially a single invention often presents subject-matter for patentability as an art, a machine and a manufacture. For instance, there is at this writing a patent in existence for an improvement pertaining to the manufacture of car wheels; the body of the wheel is cast of iron and the tire of steel, both poured while molten into the same mold at the same time being kept separate by an annular band of iron put into the matrix of the mold. In this case the inventor had his choice to patent the process, the mold, or the wheel, all being new, or he might patent all three, thus covering an art, a machine and a manufacture in what is really a single invention. He chose to patent the art, claiming the process of casting a wheel having a body of one kind or quality of metal, and a tire of another kind or quality of metal, by pouring both metals into the same mold, at or about the same time, the two metals being kept apart while molten by a circumferential band placed in the mold.

It may be remarked here, that, when a new principle in nature has been discovered, and a way devised of practically applying the principle, it is advisable in a majority, if not all cases, to claim the invention as a process or art, if it is susceptible of being so claimed; for then the use of any agencies involving the application of the principle will be an infringement of the patent, while if only the particular means—as the machine made use of—are patented, another person may devise some other means to accomplish the same result, which are not legal equivalents, and thus avoid infringement, while really making use of the principle. A process may be put in practice by means of mechanical or chemical agencies, according to its nature; in either case new agents may be employed to produce a new result, new agents may be employed to produce an old result, or old agents may be used in new relations to reach an old or a new result and, in either case, the process will be patentable. A machine, for the purposes of the patent law, may be defined as one of the simple mechanical powers or a combination of two or more of them.

The popular and common idea of a machine, as defined by Webster, is probably the one moving in the mind of the legislator who drafted the patent law—that is, a mechanical apparatus for producing or working on some tangible product.

A manufacture, in the sense of the patent law, is a finished product, in distinction from a process or a machine which are agencies for the creation of products, and in distinction, also, from products of a chemical nature. It includes most of the ordinary and vendible articles of trade—such as textile fabrics, articles of personal wear, general hardware, house furnishing goods, and the like, and perhaps some tools which, having moving parts, are really machines.

Composition of matter comprises medicinal and chemical preparations, and new compounds intended as articles of food.

NOVELTY.

The law requires that an invention, to be patentable must be "new and useful," and it is somewhat difficult to decide what constitutes patentable novelty. According to the statute an invention may be original with the inventor, and new to him, yet if it had been known or used by others in this country, or patented or described in any printed publication in this or any foreign country *before his invention*, it is not new in the meaning of the patent law, and therefore not patentable. The reason is that the inventor does not put the public in possession of anything it did not or might not have possessed before, and hence is not entitled to any reward.

On the other hand, although an invention may have been in public use for a long time in foreign countries previous to his invention, yet if it had not been patented or described in a printed publication anywhere, an original inventor of the same thing is entitled to a patent here, provided that at the time he makes application he does not know of such previous foreign use, so that he may take the oath prescribed in good faith.

The question of novelty comes up oftenest in its most difficult aspect, in determining whether an alleged invention is or is not substantially identical with some prior existing thing which was in common use here, or shown in some patent or printed publication. An invention, in such case, in order to be patentable, must be substantially unlike the prior thing.

Every change is not invention. Mere change of form in a machine or its parts does not destroy the substantial identity of the parts changed, if such parts still perform the same duty or function as before, and it must not be supposed that because one machine looks entirely unlike another, that therefore they are substantially different.

It is a general principle that an invention to be novel in the sense of the patent law, must involve one of two things: First, a *difference in the principle of operation*, as compared with any prior device; or, second, a *different result in kind*. Novelty consists in producing a new substance, or an old one in a new way, by new machinery, or a new combination of the parts of an old one, operating in a peculiar, better, cheaper or quicker method, or a new mechanical employment of a principle already known.

The novelty of a practical and successful invention cannot be destroyed by the exhibition of prior abandoned experiments tending in the same direction. Nothing short of a practically successful prior invention, actually reduced to practice and in public use, can destroy the patentable novelty of an invention which has been perfected and made practical and successful.

UTILITY.

The statute requires that a patentable invention must be useful as well as new. The topic of patentable utility can be soon disposed of. It has two phases or aspects—one absolute and the other comparative. The absolute phase is this: What utility must an invention have to render it patentable? The comparative phase is: When an alleged invention is being compared with some prior thing, in order to ascertain if the two are substantially identical, does the alleged invention possess such superior utility over the prior thing as to show that some new principle is involved in its operation?

The statute in requiring that a patentable invention shall be useful does not require that it shall possess any high degree of utility, if it is not positively noxious, immoral or hurtful, and possesses any utility that suffices. It need not be more useful than other things of its class—it need not be as useful even—and it is of no moment that an invention will not accomplish all that a sanguine inventor claimed for it. The only question is, does the invention possess any utility? Entire and absolute failure to accomplish the purpose for which an invention was intended will render a patent granted for such an invention void; but if it will accomplish its purpose in any degree, that is sufficient.

The utility of a device, as compared with that of a prior device for the same purpose, is often a question of great importance. The courts hold that where it is doubtful whether the two devices do not involve the same principle of operation, then comparative utility may be taken into consideration. If, as compared with a prior device, an alleged invention possesses superior utility, that is evidence going to show that the later device involves a different principle of operation from the former, and hence is patentably different; and in this case there are two things to be taken into consideration: First, the amount of apparent change; and, second, the amount of superior utility. If the change is small and the increased utility small, that is weak evidence toward establishing patentable difference; and if this change is considerable and the increased utility considerable, that will generally, if not always, amount to conclusive evidence that the two things are not substantially identical. When an invention is presented at the patent office as subject matter for a patent, and if it can be shown that a machine, process, manufacture, or composition of matter, is of superior utility in the matter of *cheapness* or *quality*, although the result be the same in kind as before, that is strong and often conclusive evidence of patentable novelty, and this whether the prior thing with which the alleged invention is compared be a patented thing or not.

PRIOR USE.

The statute prescribes, in section 24 of the act of July 8, 1870, that an invention to be patentable must have been "not known or used by others in this country before his (the inventor's) invention or discovery thereof."

It will be observed that such prior use or knowledge, in order to defeat a subsequent patent, must be in this country. A mere prior use in a foreign country will not invalidate a patent subsequently granted here for the same thing, unless it can be shown that the alleged inventor derived his knowledge from the foreign use, in which case he could not legally and truly make oath that he was an inventor at all. A prior use in a foreign country must not be confounded with a prior foreign publication of the invention, for that destroys a subsequent inventor's right to a patent. The patent franchise is given to an inventor because he is the first to give the knowledge of his invention *to the public*, and if some one else has not done this before him, there is no reason why he does not give to the public that thing that the public values. Keeping this principle in mind, we have no hesitation in saying that a prior use, to avail against a subsequent inventor, must be a use *in public*, a use that the public know of, or, from the conditions of the use, had full liberty to know of.

The thing that is alleged to have been in prior use must not only have been used in public, in order to avail against a subsequent inventor, but it must have been a complete and practically successful invention. No matter how many experiments had been previously made, no matter if a subsequent inventor knew all about them, if such experiments stopped short of perfection and practical success, they cannot avail against the subsequent inventor.

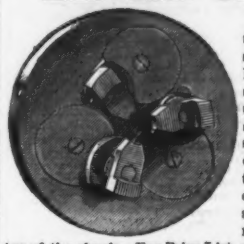
Export Taxes on Spanish Iron Ore.—The Madrid *Gazette* publishes a decree of Senor Camacho, approved by the ministers in council, authorizing the Bilbao municipality to recoup themselves their extraordinary expenses during the siege, by an export tax of 5d. per ton on iron ore and all other minerals. The preamble to the decree sets forth that: "The inhabitants of Bilboa, without distinction of classes or of fortunes, defended the unconquered city with resolute energy. To their skill, sufferings and patriotism, Liberal Spain is indebted for fresh testimonies of the decision with which a *pueblo* can sustain the national institutions. The siege was so prolonged and the defence so heroic that they could not fail to entail enormous losses. The municipality, responding to the valiant conduct of the inhabitants, the garrison and the navy, secured resources, utilized them in works of necessity, and managed that all their obligations should be satisfied with punctuality. These expenses are the origin of their present deficit in their municipal finances, and ought to be made up by the new and available revenue. The government would be wanting in their duty if they did not resort to the assistance of the capital of Biscay, and concede to it all the means its economic situation demands." The decree is as follows: "There shall be established for the unconquered city of Bilbao a transitory and extraordinary war tax of half a peseta (5d.) per ton upon iron ore and minerals of all classes shipped in the river and harbor for the Peninsula and for foreign countries. The collection shall be made at the cost of the municipality. The tax shall be applied to the reduction of the deficit in the municipal budget, caused by the defence expenditure, and shall continue until the debts incurred by the municipality through the civil war are extinguished. The government shall, in due time, give account to the Cortes of this decree."

JEWETT'S PATENT
COMBINATION
Fire-Set Vase,
Patented December 10, 1872.

WITH INSIDE RESERVOIR.

The cut explains the superior advantages of this New Coal Vase, which for convenience excels all other devices for this purpose. The Vase is very ornamental, being richly decorated. The Arms and Rests for Fire Sett detach to pack inside for shipment. Send for Illustrated Circular to the only manufacturers,
JOHN C. JEWETT & SONS, Buffalo, N. Y.

JOHNSON'S PATENT UNIVERSAL
LATHE CHUCK.



We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter of the chuck. For Price List, address,
Lambertville Iron Works, Lambertville, N. J

First & Pryibil's
461 to 467 W. 40th St.
New York City.
Salesroom,
48 Cortlandt St., N. Y.
Patent Improved
BAND SAW MACHINES.

For Bevel and Square Scroll Work and Re-sawing. Manufacture six different sizes. Prices, $165, $210, $250, $280, $360, $425, and $1000. Also manufacture CARVING, SHAPING, FLUTING, ADJUSTABLE DOUBLE SPINDLE BORING, CARVED and SERPENTINE MOLDING MACHINES. Also, GENERAL and COUNTER-BALANCED OVAL TURNING LATHES for WOOD and BRASS TURNING, METAL SPINNING, etc.
CIRCULAR SAW BENCHES, SHAFTING PULLEYS, and HANGERS.
A large assortment of the best FRENCH BAND SAW BLADES, at greatly reduced prices. And a Machine that will set an ordinary Band Saw PERFECT in two and a half to three minutes.

WILLIAMS WHITE & CHURCHILL,
Successors to
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Awning Hooks, Meat Hooks, Pincers,
Champion Noiseless Pulleys,
CHAIN PULLEYS, &c.
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Get Binders
FOR THE IRON AGE.

We have made arrangements to furnish KOCH'S PATENT BINDER, which we think altogether the best before the public, to our subscribers at the following very low rates—about the wholesale prices by the dozen.

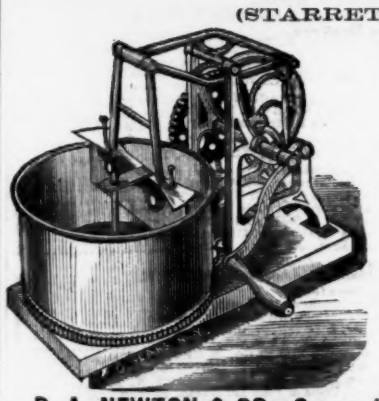
Half Cloth.....$1·00 each.
(Cloth Back and Corners, with Morocco Paper Sides—a good, serviceable Binder.)
Full Cloth..... 1·50
(Morocco Cloth Back and Sides.)
Half Roan..... 1·75 "
(Roan Back; Cloth Sides.)
Half Morocco..... 2·00 "
(Morocco Back and Corners; Cloth Sides.)

The above are all in black, which is the most serviceable color, with the exception of the Half Morocco, which are put up in a number of handsome shades. The name of the paper is stamped in gold on either side, and each Binder is furnished with loops by which it can be hung up against the wall as newspaper files are usually disposed of.

The Binders will each hold the twenty-six numbers in the form of a bound volume. They can be nicely inserted in two or three minutes by any boy of ordinary intelligence; and when the covers are full they can be either preserved in that shape as bound volumes of *The Iron Age*, or they can be emptied and used again. There is no possibility of their getting out of order, unless the cords, which are very strong, wear out, when anyone can easily replace them with a piece of fishing line or other suitable string. Subscribers who value the paper should order them at once, so as to keep the paper in good order.

On receipt of the price we will ship them, safely put up, by any express line or to any New York house to be packed. They are too large to be sent by mail.

American Meat & Vegetable Chopper.
(STARRETT'S PATENT.)



Superior to all others, either for Family or Butchers' Use.

Over 50,000 Sold.

Four sizes for the use of Families, Hotels, Restaurants, Bakeries, &c. The demand for these celebrated Choppers has constantly increased during the five years they have been before the public, until now the annual sales reach more than three times that of all other Family Choppers combined.

Three sizes for Butchers' use.

These Choppes require one-third less power than any other Chopper in market doing the same work, and hence for butchers who have not the use of steam-power are superior to all others. They are warranted to give entire satisfaction.

For descriptive circular and price list, address

D. A. NEWTON & CO., General Agents, 110 Chambers St., N. Y.

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LLOYD, SUPPLEE & WALTON,
WHOLESALE
HARDWARE HOUSE,
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HENRY DISSTON & SONS,
Keystone Saw, Tool, Steel and File Works,
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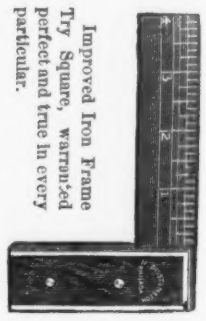
Manufacturers of SHEET STEEL, and all Articles made from Sheet Steel.

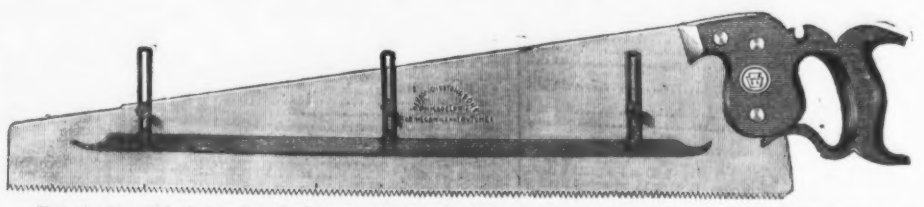
SAWS OF EVERY DESCRIPTION.

Also, FILES, TOOLS, Etc., and all kinds of Labor Saving Implements for keeping Saws in perfect order.

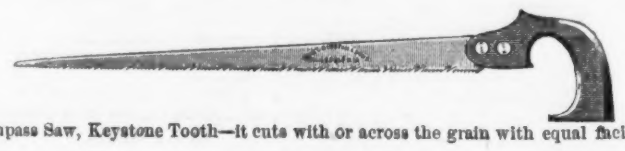
Hand Saw with adjustable handle. The thumb screws in the handle operate on the butt of the saw blade, and can be so adjusted as to give the blade any desired pitch.



Improved Iron Frame Try Square, warranted perfect and true in every particular.



Patent adjustable Gauge Saw for sawing tenons, kerfing, or any work where the cut is required to be of definite depth. Will pay for itself in one day. Try it and be convinced. Remove the gauge and use as an ordinary saw.



Compass Saw, Keystone Tooth—it cuts with or across the grain with equal facility.

Hack Saw. The blade in this Saw is reversible, an advantage which will be readily appreciated by mechanics.

READ, MARK, LEARN.

We guarantee our Cross-Cut Saws to do more work, day in and day out, the season through, than any other saw in the market.

The test of practical experience has been applied, the verdict given, the fiat has gone forth, and the Humbugs are fast fizzling out, while our rapidly increasing sales testify to the estimation in which these saws are held.

We pledge ourselves that no effort shall be wanting to keep up the standard and reputation of our manufactures.

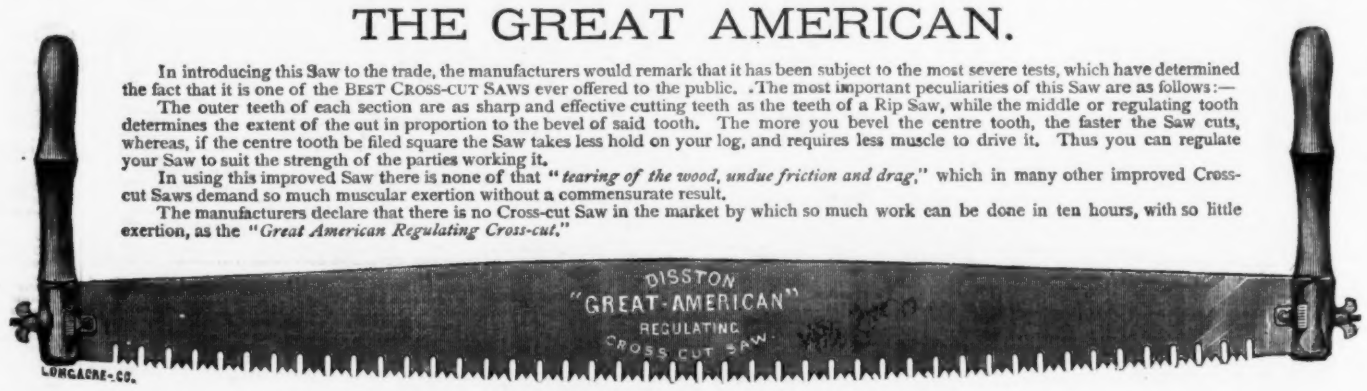
THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag*," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

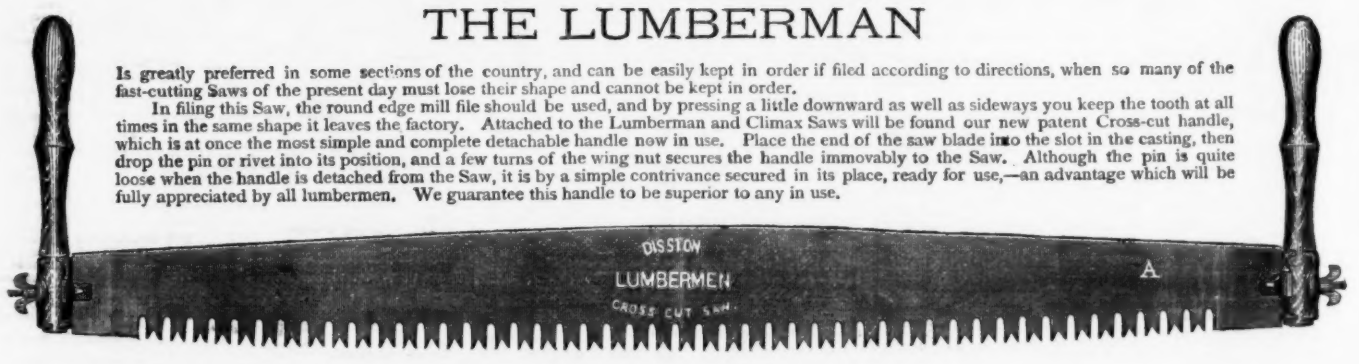
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-cut.*"



THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

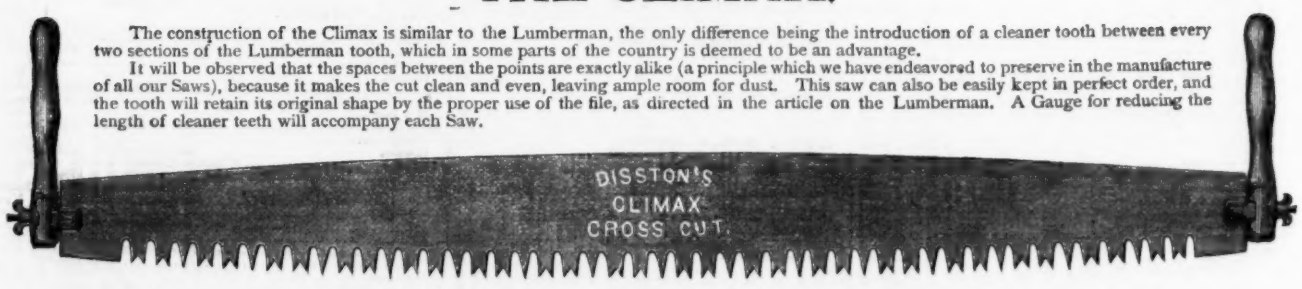
In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

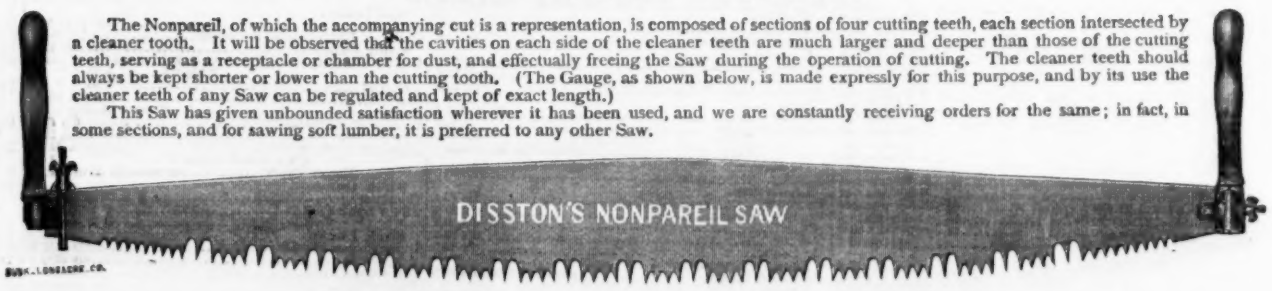
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.



Plain Truths for Practical Men.

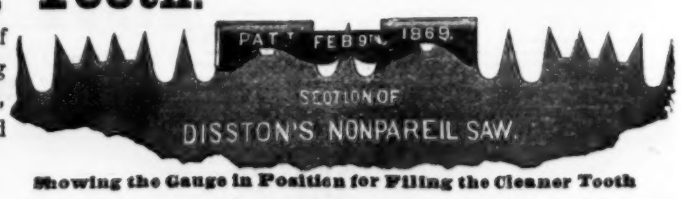
We guarantee our Cross-Cut Saws to do more work, day in and day out, the season through, than any other saw in the market.

The test of practica experience has been applied, the verdict given, the fiat has gone forth, and the Humbugs are fast fizzling out, while our rapidly increasing sales testify to the estimation in which these saws are held.

We pledge ourselves that no effort shall be wanting to keep up the standard and reputation of our manufactures.

Gauge for Regulating Cleaning Teeth.

The cleaning teeth of all saws should be somewhat shorter than the cutting teeth, and, although shortened, they should be of uniform length throughout. The inner edge of the Gauge rests on the points of the cutting teeth, the cleaning teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a file, until arrested by the edges of the Gauge, which is made of hardened steel. Thus tooth after tooth can be rapidly and correctly reduced to an even length by any unskilled operator



Showing the Gauge in Position for Filing the Cleaner Tooth

New York Wholesale Prices, September 9, 1874.

HARDWARE.

Anvils.
Solid Cast Steel.......................℘ ℔ 14c
Wright's..........℘ ℔ gold 12c ; over 250 ℔s 12½c, gold
Armitage's Mouse Hole..........................gold 11c
Wilkinson's..............................℘ ℔ gold 11½c
Eagle Anvils, ℘ ℔ 11c currency...............dis 15&10 %

Apple Parers.
Domestic, Turn Table, Lightning, Hudson's, Reading, Union, Skeleton Paring, Coring and Slicing....$8·00 ℘ doz
Bay State, Paring, Coring and Slicing........$15 00 dis 5 %
Climax Slicer..8 00
Bay State Peach Parer..................$11 00 @ 11 50
Lightning " " ....11 00 @ 11 50
Peach Stoner and Halver..............................7 00

Augers and Bits.
Snell Mfg. Co.................................dis 15 @ 20 %
Russell Jennings...................................dis 10 %
Douglass Mfg. Co., Extra.....................25&10&10 %
" " No. 1.....................25, 10, 10&5 %
" " Hollow Augers.....................25&10 %
Cushman's Expanding Hollow Augers...............dis 20 %
Ives' Augers and Bits..............................dis 40 %
Gouge Lip Augers and Bits...................dis 30&10 %
" Hollow Augers.................................dis 25&10 %
" Expansive Hollow Augers.........................dis 40 %
" Expansive Bits.................................dis 20&10 %
Andrews' Bits.......................................dis 25 %
Clark's Expansive Bits..............................dis 15 %
Cook's Patent Augers................................dis 50 %
" " Bits...........................dis 40&10 %
Shepardson's Double Cut Bits.......................dis 20 %
Griswold's Patent...................................dis 20 %
Cast Steel Cut Augers..........................dis 37½&10 %
" Auger Bits...........................dis 37½&10 %
Gimlet Bits.......................................dis 10&10 %
Long Augers................................new list dis 40 %
Bonney's Patent Hollow..................$48 per doz—dis 25 %
Stearns' " " ....$48 per doz—dis 25 %
Morse's Bit Stock Drills............................dis 20 %
Nobles Mfg. Co. C. S. Cut Augers.................dis 30&10 %
L'Hommedieu's Ship Augers.........................dis 15 %
Watrous Ship Augers.................................dis 15 %
Vaughan's Post Hole—
6 in. $23 00 ; 9 in. $25 per doz....................dis 20 %

Awls and Tools.
Aiken's..dis 25 %
Nos. 42 and 43....................................dis 30&10 %

Axes.
Brook's........................per doz $13 00 @ 14 00 net
Blood's...............................per doz $12 50 @ 14 00
Hunt's..........℘ doz $14 00 @ 19 00 dis 5&5&5 % cash
Collins'..........℘ doz 11 00 @ 15 50 net @ dis 5 %
Hurd's.................................℘ doz 12 50 @ 13 50
Schweitzer Mfg. Co.'s...................℘ doz 13 00 @ 15 00
Simmons'...............................℘ doz 12 50 @ 14 00
Morris'................................℘ doz 12 50 @ 13 50
Red Jacket.............................℘ doz 12 00 @ 12 50
Mann's.................................℘ doz 11 50 @ 13 00
Double Bitted..........................℘ doz 21 50 @ 22 00
Lowell Tool Co., "Peerless"...........℘ doz 13 00 @ 14 50
Underhill's............................℘ doz 12 00 @ 13 00
" Crown.............................℘ doz 12 50 @ 13 50
John Leverett's........................℘ doz 12 50 @ 15 50
Nobles Mfg. Co. S. B...................℘ doz 12 50 @ 13 00
" D. B...................℘ doz 22 00 @ 23 00
Ten Eyck.......................℘ doz $11 00 @ 12 50 net

Balances.
Chatillon's, Frary's, Morton's..............new list dis 15 %

Bands.
Plated................................new list dis 50&5 %
Iron Rim..............................new list dis 25&5 %
Brass (Plated list)...............new list dis 50, 10&5 %
Oroide................................new list dis 50&5 %

Bells.
Hand, Light Brass..............................dis 66⅔&10 %
Hand Ex. Heavy.....................................dis 40&10 %
White Metal......................................dis 50&10 %
Sheep...dis 25 %
Swiss...dis 50 %
Globe..dis 15&10 %
Abbe's...dis 15&10 %
Taylor's Patent Door................................dis 25 %
Western Gong..dis 25 %
Brook's Crank...........................revised list dis 50 %
" Pull...........................revised list dis 50 %
Hart Mfg. Co., Crank and Pull...................dis 50&10 %
Cow—Common Wrought..............................dis 20&10 %
Western.......................new list dis 20&10 %
Kentucky "Star"...............new list dis 20&10 %
Dodge's Genuine Kentucky..............new list dis 35 %
Yaw's Genuine.......................................dis 30 %
Texas...dis 35 %
Call..dis 15 %

Bellows.
Blacksmiths'..dis 20 %
Moulders'...dis 15 %
Hand Bellows..dis 10 %

Blind Fasteners.
Mackrell's..dis 30 %
Van Sand's...............................℘ gross $14 00
Washburn's Patent........................℘ gross 14 00
Merriman's.....................................new list net

Blind Staples.
Boardman's Patent, ⅜ in. and larger............℘ ℔ 37 c
" " ¼ in................................" 42 c

Bolts.
Carriage and Tire, Ætna Nut Co.....................dis 60 %
Stove, Ætna Nut Co..............................dis 10&5 %
Cast Iron Barrel, Shutter, &c.......new list dis 60, 10&10 %
Wrought Iron Barrel..............new list dis 50, 10&10 %
" " Square..............new list dis 50, 10&10 %
Wrought Iron Flush..................................dis 25 %
Carriage and Tire, Common.......................dis 75&10 %
" " " Norway Iron...........................
Star, Philadelphia.........................dis 50 @ 50&10 %
Eagle, Philadelphia........................dis 50 @ 50&10 %
Philadelphia Pattern, P. S. & W.................dis 50&10 %
Tire, Bessemer Steel, Hubbard & Curtiss.............dis 50 %
Carriage and Tire, R. B. & W.............old list dis 50&5 %
Plow, R. B. & W.....................................dis 30 %
Stove, R. B. & W....................................dis 10 %
" Shelton Co, Shaved Heads.........................dis 15 %
Union Nut Co., old list.....................dis 50&2½&5 %
" " Stove..........................dis 15 %
Machine..dis 40 @ 45 %

Borax....℘ ℔ 18c

Boring Machines.
Kellogg's...dis 15 %
Snell Mfg. Co., Rice's Patent.......................dis 20 %
" " Regular.............................dis 20 %
Douglas Mfg. Co.................................dis 20&10 %
Morticing Machines each............................$18 00

Bow Pins.—Union Nut Co., new list....dis 50&10&5 %

Braces.
Hildreth's Patent..............................dis 40, 10&5 %
Barber's Patent..................................dis 40&5 %
Q. S. Backus....................................dis 40&10 %
Wilson Mfg. Co..........................new list dis 10 %
Spofford's Patent................................dis 40&5 %
Noble's Patent...................................dis 40&5 %
Bartholomew's American Ball....................dis 10&10 %
" Patent Grip...........................dis 40 %
Ives' Novelty....................................dis 40&5 %
Common Ball.....................................dis 15&10 %

Brackets.
Shelf...dis 60&10 %

Bull Rings.—Union Nut Co., new list.dis 50&10&5 %

Bung Hole Borers.
Common and Ring.....................................dis 25 %
Enterprise Mfg. Co..............................dis 20&10 %
Ives' Tap Borers....................................dis 25 %

Butchers' Cleavers.
Humason & Bukley Mfg. Co.......................dis 20&10 %
Bradley's...dis 25 %
Beatty's...................................new list dis 20 %

2	3	4	5	6	7	8	9
$19·00	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

Hart Mfg. Co...................................dis 45&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$30·25	$38·75	$43·55	$48·50	$54·00

Butts.
Wrought Brass..........................new list dis 30 %
Cast Fast Joint, Narrow............................dis 50&5 %
" " Broad...............................dis 50&5 %
Cast Loose Joint...................................dis 60&5 %
" " Mayer..............................dis 50&5 %
" " Parliament.........................dis 50&5 %
Drilled Wire Jointed—
Narrow..dis 50&10 %
Broad...dis 50 %
Loose Joint...dis 60 %
Mayer's...dis 40&10 %
Parliament......................................dis 40&10 %
Loose Pin.......................................dis 50&10 %
Wrought Fast Joint, Narrow..........................dis 30 %
Wrought Broad.......................................dis 35 %
" Loose Joint...................................dis 35 %
Wrought Table and Back Flaps........................dis 30 %
Lull & Porter's Blind Butts.........................dis 50 %
Palmer Blind Butts..............................dis 30&10 %
Nicholson Blind Butts...........................dis 40&10 %
Parker's Blind Butts.............................dis 50&5 %
Huffer's Blind Butts............................dis 30&10 %
Clark's Surface Blind Hinges, Nos. 1, 3 and 5....dis 50&5 %
" " " " No. 40 and 50.....dis 50&5 %
" " " " No. 20...............dis 60 %
" Mortise " " 2, 4, 4½, 5, 6, 8, 10.....dis 35 %
Seymour's..dis 50&5 %
Shepard's..dis 50&5 %
Garretson's....No. 1, dis 50&10 % ; Nos. 2 and 7, dis 50&5 %
The American Spiral Spring Butt Co..................dis 20 %
Standard...dis 50&5 %

Caps—Percussion, per 1000.
G. D...37c
Ely's E. B....................1-4s, 58c. ; 1-10s, 65c., gold
" Double Waterproof, 1-4s, $1·45 ; 1-10s, $1·52½c., gold
Colt's..1-10s 70c., gold

Carpet Sweepers.
Union..each $2 75 net
Welcome..each 2 75 net

Cartridges.
Metallic...................................dis 50 @ 50&10 %

Cards.—Horse and Curry.........................dis 30&10 %
Cotton.................................new list dis 10&10 %
Wool...................................new list dis 15&10 %

Carpet Stretchers.
P. S. & W..................per doz $2 00 ; dis 40&5 %

Casters.
Bed...dis 30&10 %
Plate...dis 40&10 %
Sewing Machine..................................dis 70&10 %

Cattle Leaders.....................new list dis 60&10 %

Chain.
English Coil...net gold

℘ ℔	13c	9¼	9	8½	8¼	8c
	3-16	¼	5-16	⅜	7-16	½

Trace, 6½-10-2..................by the cask, ℘ pair, gold, 58c
Trace, 7-10-2...................by the cask, ℘ pair gold, 63c
Galvanized Pump Chain..................................℘ ℔ 14c
German Halter Chain.....................new list, Jan. 1, dis 15 %
German Coil.............................new list, Jan. 1, dis 15 %
Jack Chain, Iron....................................dis 50 %
" Brass...dis 40 %

Chalk.
White.......................................℘ gross, 50c
Red...℘ gross, 75c
Blue..℘ gross, 90c
Crayons.....................................℘ gross, 14c

Cherry Stoners.
Family"...℘ doz $8·50

Chisels.
Socket Firmers..................................dis 60&10 %
Socket Framing..................................dis 60&10 %
Socket Corner...................................dis 60&10 %
Tanged Firmers..................................dis 45&10 %
Butcher's..........................$5·50 to £ gold—new list
Newbould's....................................$5·50 to £ gold
Spear & Jackson's..................$5·50 to £ gold—new list

Clamps.
Cabinet...dis 60&10 %
Judd's..dis 45&10 %
Lambert's...dis 20 %
Providence Tool Co..................................dis 10 %

Clips, Axle.
Norway or Best......................................dis 30 %
Superior..dis 50 %
"Star," Superior Philadelphia....................dis 45&5 %

Coal Shovels.
Iron Handled.......................℘ doz, $ 85 @ 1 25
Wooden Handled.....................℘ doz, 1 00 @ 2 00

Coal Hods.—Smith, Burns & Co..............dis 15 @ 25 %

	14	15	16	17	18 inch.
Japanned	$6·00	6·35	6·75	7·50	8·00 per doz.
Galvanized	9·50	10·00	10·75	11·50	12·50 "

Morning Glory Funnel Hods—

No.	15	16	17
Japanned	$9·00	10·50	12·00 per doz
Galvanized	13·00	14·50	16·00 "

Cockeyes...dis 30 %

Cocks.
Brass Racking...................................dis 20&10 %
Lock and Globe..................................dis 20&10 %

Coffee Mills.
Board and Box.......................................dis 15 %
Increase Wilson's..........................new list dis 15 %
Selsor's Pat.........................$9·50, $10·50—dis 25 %
French Steel..dis 15 %
The Swift...dis 25 %
"American"..dis 20 %
Enterprise Mfg. Co..............................dis 20&10 %
Diamond, per doz $4 00..............................dis 10 %

Compasses and Dividers.
Bemis...dis 35 %
Cook's..dis 15 %
Excelsior...dis 30 %
Peck Stow & Wilcox..................................dis 25 %

Coopers' Tools.
Bradley's.....................................dis 15 @ 20 %
Chas. E. Little...............................dis 20 @ 25 %
Swan & Brombacher.............................dis 15 @ 20 %

Corkscrews...dis 25 %

Corn Knives and Cutters.
Bradley's...dis 10 %

Croquet.—Phiness Smith.........................dis 40&10

Crow Bars.
Cast Steel......................................℘ ℔ 11c. net
Iron, steel points...................................℘ ℔ 6c

Crucibles.
Gautier & Co.......................................℘ No. 5½c

Curling Irons..................................dis 20&10 %

Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass............dis 25 %
Fitch's...dis 15&10 %
Rubber..................................℘ doz, $9·00—dis 15 %
Schweitzer Mfg. Co..................................dis 20 %
The Lawrence Curry Comb Co..........................dis 20 %

Curtain Pins.
Silvered Glass..............................old list dis 45&10 %

Cutlery.
American Table.....................................net list
American Pocket.....................................dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co...........dis 20&10 %

Dippers.
Britannia........per doz 7·50—dis 30 % ; by bbl. dis 33⅓ %
Cocoa, Plain.........................per doz $3·25—dis 20 %
" Rimmed.......................per doz 3·75—dis 20 %

Dog Collars.
Embossed Gilt.......................................dis 20 %
Leather...dis 20 %

Door Springs.
Gray's.................................$7·50 ℘ doz—dis 50 %
Torrey's Patent........................$7·50 ℘ doz—dis 50 %
Palmer's Japanned No. 6...............................℘ doz $5·00
" Coppered "....................................." 6·00
" Silvered "....................................." 8·00
Challenge.—
Japanned..............................℘ doz $4 00 @ 6 00
Bronzed...............................℘ doz 5 00 @ 7 00
Nickel Plated.........................℘ doz 6 50 @ 9 00
1 Gross lots..dis 10 %
5 Gross lots..dis 20 %

Drawing Knives........................dis 60 @ 60&10 %
Bradley's...dis 25 %
Adjustable Handled..................................dis 15 %

Drills.
Ingersoll's Ratchet.................................dis 25 %
Moore's Triple Acting Ratchet.......................dis 20 %
Whitney's Ratchet...................................dis 20 %
Blacksmiths'..........................each $7 75—dis 60&10 %

Drill Chucks.
The Danbury.............................each 10·00—dis 25 @ 30 %

Drug Mills.
American Drug Mills.................................dis 20 %

Egg Beaters.
Monroe's.................8 in. 10 in.
Per doz $8·00 9·00.....................................dis 10 %
Dover...℘ doz net $6·00
National..............................℘ doz $4·50—dis 20 %
Peerless..............................℘ doz $4·00—dis 10 %

Emery.
Genuine Chester—Regular Nos........℘ ℔ 7c } dis 5 @ 10 %
" Flour and FF.......℘ ℔ 4c }
Washington Mills—Regular Nos........................℘ ℔ 8c
" Flour...℘ ℔ 5c

Enameled and Tinned Ware.
Kettles...dis 35 %
Sauce Pans..dis 25 %
Glue Kettles..dis 20 %
Tinned Saucepans....................................dis 25 %

Escutcheons.
Brass Thread....................................dis 60&10 %
Wood..dis 25 %

Faucets.
Cork Lined, Wood.....................dis 60 % ; by bbl. 60&7½ %
Fenn's..dis 50 %
" Cork Stops..dis 40 %
Star..dis 55&10 %
Frary's Patent Petroleum........................dis 15&10 %
Taylor's Pattern " ....dis 20&10 %
Wood and Metallic...................................dis 40 %

Felloe Plates......................℘ ℔ 14c ; dis 10 %

Files.
American File Co...............$5 00 to £ currency—dis 10 %
Nicholson......................$5 00 to £ currency—dis 12½ %
Newbould's...................................5 25 to £ gold
J. & Riley Carr's Files and Rasps............5 50 to £ gold
Stubs'..............................8 50 @ 9 00 to £ gold
Butcher's....................................5 50 to £ gold
Walter Spencer & Co.'s "Diamond"............5 25 to £ gold
Spear & Jackson's............................5 00 to £ gold
Hargreaves, Smith & Co.'s....................5 00 to £ gold
Jowitt's.....................................5 25 to £ gold
"Western"....................................5 00 to £ net
W. K. & C. Peace's "Imperial"................5 25 to £ gold
R. Ibbotson..................................5 00 to £ gold
Beam & Murray, "Cyclops".....................4 85 to £ gold
Fisher's.....................................4 75 to £ gold
Goodlad's....................................4 00 to £ gold
Moss & Gamble......................5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 5 00 to £ gold
" " Horse Rasps..............5 50 to £ gold
"Philo Sheffield," P. T. Co..................5 00 to £ gold

Floral Tools.......................................dis 25 %

Fluting Machines.
Mrs. Coles, 7 inch rolls...............................6 50
" " 5 " " 5 50
Knox, with 4-inch Rolls..............5 00 each dis 12½ %
" " 6 " " ....6 00 each dis 12½ %
O. K...6 50 each net
Peerless, 4-inch Rolls.........................4 00 each net
" 5 " " ....4 75 each net
Excelsior, No. 1...............................4 75 each net
" No. 2...............................6 50 each net
Diamond..7 50 each net
Climax 7-inch Rolls............................8 00 each net
" 4½ " ....6 50 each net
Empire...4 00 each net
Eureka, No. 1, 7-inch Roll.....................8 00 each net
" No. 2, 5-inch Roll.....................6 00 each net
K. F. M., 4½-inch Roll.........................5 50 each net
" 6-inch Roll...........................6 00 each net
Myers' Fashion Fluter, 4½-inch Rolls...........3 00 each net
" Convex Brass Fluter, Sad Iron attachment..$1·75
Domestic Fluter...............................$1·75 each net
Fairy, Self-Heater.............................8 00 each net
Geneva Hand Fluter........................$15 00 per doz net
Champion, 6 inch rolls.....................$6 00 each dis 10 %
" 4 inch rolls.....................$5 00 each dis 10 %

Fluting Scissors...............................dis 20&10 %

Forges.
Keystone Portable Forge Co.'s.......................dis 20 %
"Empire" (W. P. Kellogg & Co.)......................dis 20 %

Forks.
Hay, Manure & Spading...............................dis 25 %
Plated A 1...................................dis 40, 10&5 %

Freezers.
Champion...dis 33⅓
Torrey's..dis 50 %

Fry Pans.—P. S. & W.
Tinned..dis 30 %

℘ doz	$3·00	3·25	3·62	4·00	4·50	5·00	5·50	6·00	7·50
No.	0	1	2	3	4	5	6	7	8

Smith, Burns & Co., "Excelsior" Polished..........dis 35 %

℘ doz	$3·70	4·00	4·70	5·80	6·00	7·00	8·00	9·00
No.	1	2	3		5	6	7	8

Gas Stoves.
Tiff & Howard.......................................dis 20 %

Gauges.
Marking...dis 45&10 %
Wire..dis 10 %

Grind Stones.
J. F. Green & Bro...................................dis 20 %

Grind Stone Fixtures...........................dis 50&10 %

Hammers.
Emmet Hammer Co.....................................dis 25 %
Humason & Beckley Mfg. Co....................dis 16⅔&10 %
Maydole's, new list..................................dis 5 %
Cheney's.......................................new list net
Verree...dis 5 %
Yerks & Plumb...............new advanced list dis 12½ %
Minot & Co..dis 15 %
Magnetic Tack...................................dis 20&10 %
Warner's..list net

Hand Cuffs and Leg Irons.
Tower's...dis 25 %

Handles.
Wrought Chest...................................dis 60&10 %
Flush Chest.....................................dis 60&10 %
Lifting...dis 60&10 %
Coffin..dis 50&10 %
Saw and Plane...................................dis 20&10 %
Hammer and Hatchet..................................dis 10 %
Greensboro', Axe, Pick, Hammer, &c..................dis 10 %
Woolworth Axe, Pick and Sledge......................dis 10 %
Brad Awl....................per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 10&10 %
" " " large " 6 25—dis 10&10 %
Apple " " ass'td " 6 00—dis 10&10 %
" " " large " 7 00—dis 10&10 %
Socket " " ass'td " 3 50—dis 10&10 %
" Framing " " " 6 00—dis 10&10 %
File..........................." " 3 50—dis 10&10 %
Auger.........................." " 5 50—dis 10&10 %
" large " 6 50—dis 10&10 %

Hangers.
Barn Door.......................................dis 65&10 %
"Anti-Friction" (Rider, Wooster & Co.)..............dis 30 %
Novelty...dis 30 %

Harness Snaps.
Henshaw's.......................................dis 25&10 %
Judd's..dis 40 %
Fitch's...dis 30 %
Hotchkiss'..dis 10 %
Andrews'..dis 25 %
Sargent's.............................new list dis 50&10 %
New York Wire...................................dis 20&20 %

Hatchets.—Isaiah Blood............................dis 10 %

Shingling, Nos. 1 2 3	℘ doz $7 50	8 00	8 50	
Claw, " 1 2 3	℘ doz 8 50	9 00	9 50	
Lathing, " 1 2 3	℘ doz 7 50	8 00	8 50	

Hunt's..dis 10 %

Shingling, Nos. 1 2 3	℘ doz $7 25	8 00	8 75	
Claw, " 1 2 3	℘ doz 7 75	8 50	9 25	
Lathing, " 1 2 3	℘ doz 7 50	8 25	9 00	

Hurd's..dis 30 %

Shingling, Nos. 1 2 3	℘ doz $8 00	8 50	9 00	
Claw, " 1 2 3	℘ doz 9 00	9 50	10 00	
Lathing, " 1 2 3	℘ doz 8 00	8 50	9 00	

Newark's Edge Tool Co.'s............................dis 25 %

Shingling, Nos. 1 2 3	℘ doz $6 50	7 00	7 50	
Claw, " 1 2 3	℘ doz 7 25	7 75	8 25	
Lathing, " 1 2 3	℘ doz 6 50	7 00	7 50	

Yerkes & Plumb....................................dis 12½ %

Shingling, Nos. 1 2 3	℘ doz $7 00	7 50	8 00	
Claw, " 1 2 3	℘ doz 7 50	8 00	8 50	
Lathing, " 1 2 3	℘ doz 7 00	7 50	8 00	

Simmon's..dis 15 %

Shingling, Nos. 0 1 2 3	℘ doz $7 50	8 00	8 50	9 00
Claw, " 1 2 3	℘ doz	9 00	9 50	10 00
Lathing, " 1 2 3	℘ doz	8 00	8 50	9 00
Broad, " 1 2 3	℘ doz	9 00	10 00	12 00
" " 4 5 6	℘ doz	14 00	16 00	18 00
" " 7 8	℘ doz	20 00	22 00	

Elephant..dis 25 %

Shingling, Nos. 1 2 3	℘ doz $8 00	8 50	9 00	
Claw, " 1 2 3	℘ doz 9 00	9 50	10 00	
Lathing, " 1 2 3	℘ doz 8 00	8 50	9 00	

J. P. Verree & Co....................................dis 5 %

Shingling, Nos. 1 2 3	℘ doz $7 00	7 50	8 00	
Claw, " 1 2 3	℘ doz 7 50	8 00	8 50	
Lathing, " 1 2 3	℘ doz 7 00	7 50	8 00	

Underhill's...dis 10 %

Shingling, Nos. 1 2 3	℘ doz 7 25	8 00	8 75	
Claw, " 1 2 3	℘ doz 7 75	8 50	9 25	
Lathing, " 1 2 3	℘ doz 12 00	11 00	13 00	

Hinges.
Gate, Western.....................℘ doz $6·25—dis 60&10 %
" N. E..........................℘ doz 11·25—dis 65&10 %
" N. Y. State....................℘ doz 6·25—dis 60&10 %
Rolled Plate..dis 75 %
" Raised..dis 75 %
Wrought Strap and T.............................dis 20&10 %
Providence Plate. { 6 and 8 in. list 11c. / over 8 in. list 9½c. } ......dis 25&10 %
Screw Hook and Strap......... { 8, 10, 12 in. 7½c / 14 to 36 in. 5¾c } ....net
Heavy Welded Hook......... { 8 to 12 in., 9c / 14 in. & up, 8½c } dis 10 %
Screw Hook and Eye......... { ¾ to 1 in., 9½c / ⅝ in. 10½c / ½ in. 12½c } ....net

Hoes.
Solid Shank, C. S.....................℘ doz $8 00—dis 30 %
Socket................................℘ doz 9 00—dis 30 %
Riveted Eye...........................℘ doz 5 00—dis 30 %
Grub..dis 20 %
Planters'—Winsted..................................add 10 %
Scovill..add 33⅓ %
Scovill Pattern (Winsted)..........................add 20 %

Hooks.
Harness.......................................dis 60, 10&5 %
Bird Cage.......................................dis 70&10 %
Cotton..dis 50 %
Belt..dis 50&10 %
Clothes Line................................dis 60&10&10 %
Bench—Skinner's......................per doz $8 00, dis 30&10 %
Bench—Hotchkiss' $5 00 ℘ doz.......................dis 10 %
Bench—Weston's No. 1, $8·00 ; No. 2, $7·00 per doz net
" —McGill's............................$3 00 per doz, dis 10 %
Wardrobe, Japanned.................new list dis 60, 10&10 %
Hat and Coat " ....new list dis 60, 10&10 %
Wrought Staples and Hooks and Staples...........dis 70&10 %
Screw Hooks and Eyes, revised list..............dis 70&10 %
Grass...dis 20 %
Whiffletree—Patent..................................dis 30 %
Hooks and Eyes—Malleable Iron.......................dis 55 %
" " Brass...dis 55 %

Horse Nails.

Putnam's.

No.	5	6	7	8	9	10
	32c	28c	26c	25c	24c	23c

In lots 2000 lbs. dis. 5 %.

Ausable Horse Nail Co.

No.	5	6	7	8	9	10
Ausable	30c	27c	25c	24c	2 c	22c
Pointed and Polished	31c	28c	26c	25c	24c	23c
Pointed and Blued	32c	29c	27c	26c	25c	24c

In lots of 1000 lbs., 5% discount.

Brundage.

No.	5	6	7	8	9	10
	29c	26c	24c	23c	22c	21c

In lots of 500 lbs., dis. 5 %.

American Pressed.

No.	5	6	7	8	9	10
	22c	20c	20c	20c	20c	20c

In lots of 1000 lbs. dis 5 %.

Perkins Finished (ready to drive).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs. dis 5 %.

Buffalo Forged.

No.	6	7	8	9	10
	28c	26c	25c	24c	23c

Globe (Pointed and Polished).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs., 5 % discount.

National (Pointed and Polished).

No.	5	6	7	8	9	10
Patent Finish	28	25	23	22	21	20
Extra "	30	27	25	24	23	22

In lots of 1000 lbs., dis 5 %.

Vulcan (Blued, pointed, ready to drive).

No.	5	6	7	8	9	10
	33c	30c	28c	27c	26c	25c

In lots of 500 lbs., 5 % discount.
" 1000 lbs 7½ % discount.

New London Horse Nails.

No.	6	7	8	9	10
Great Western	27c	25c	24c	23c	22c
U B	29c	27c	26c	25c	24c

In lots of 1000 lbs., dis 5 %.
Star Brand..℘ ℔ 16c
Morgan...14c

Horse Shoes.
Burden...℘ keg, $5 85
R. I. Horse Shoe Co., Perkins Pattern............℘ keg, 5 85
" " R. I. Pattern.......................℘ keg, 6 35
Mule Shoes.......................................℘ keg, 6 85

Ice Picks.
Iron........................℘ gross $12 00 @ $16 00 net
White's.............................per doz $2 50 dis 10 %
W. H................................per doz 1 60 dis 10 %
Dunlap's...................................per doz 3 00 net

Kettles.
Brass...℘ ℔ 55c net
In lots of 500 ℔s...............................℘ ℔ 50c net

Knives.
Ames' Butcher Knives................................dis 20 %
" Shoe " ....dis 15 %
Hay and Straw, "Wadsworth's"........................dis 20 %

Knobs.
Carriage..dis 60&10 %
Base—Common...net
" Plush Tip...dis 10 %
" Elastic End.....................reduced list dis 10&10 %

Ladles.
Melting...dis 20 %

Lanterns.
Peerless..dis 10 %
Brady's Patent......................................dis 10 %
Ætna..dis 10 %
Yankee..dis 10 %
De Beque..dis 10 %

Lemon Squeezers.
Porcelain Lined.....................per doz $7 00, dis 10 %

Lines.
Linen Fish......................................dis 10&10 %
Cotton Chalk..dis 40 %
Silver Lake Chalk...............................dis 10&10 %
Mason's...dis 10&10 %
Galvanized Wire Clothes...............$1 per 100 ft. dis 30 %

Locks and Latches.
Cabinet—Eagle.......................................dis 25 %
Cabinet—Gaylord.....................................dis 25 %
Langstroth & Crane..................................dis 40 %
Trunk...dis 10 %
Continental...dis 15 %
Shepardson's..dis 20 %
Romer's Padlocks....................................dis 15 %
Scandinavian Jail...................................dis 10 %
American Lock Co..................................dis 33⅓ %
Plate...dis 25 %
Pad....................new list dis 50, and 2 % for cash
Barnes & Deitz......................................dis 25 %
Yale Lock Co..dis 40 %
Sargent & Greenleaf.................................dis 20 %

Trenton Lock Co., Branford, Norwich, Russell & Erwin, Norwalk, Nashua, Mallory, Wheeler & Co., P. & F. Corbin, Parker & Whipple, Jacobus & Nimick Mfg. Co.......New list dis 45 %. 2 % extra for cash.

Mallets.
Hickory and Lignumvitæ..............................dis 20 %

Meat Cutters.
Dixon's (P. S. & W.)................................dis 10 %

No.	1	2	3	4
℘ doz	$14 00	$17 00	$19 00	$30 00

Hales'..dis 25 %

No.	11	12	13
℘ doz	$27 00	$33 00	$42 00

Miles Challenge.....................................dis 20 %

No.	1	2	3
℘ doz	$22·00	$30·00	$40 00

Perry's Champion (P. S. & W.).......................dis 10 %

No.	200	300	400
℘ doz	$22 00	$27 00	$40 00

Woodruff's (P. S. & W.).............................dis 10 %

No.	100	150
℘ doz	$15 00	$18 00

American..dis 25 @ 25&5 %

No.	1	2	2½	3	4	B	5
Each	$6·00	$9·00	$12·00	$15·00	$30·00	$60·00	$75·00

Molasses Gates.
Stebbins' Pattern...............................dis 60&10 %
Tinned ends.....................................dis 40&10 %
Patent Self-Measuring...........per doz $42 00—dis 20&10 %
Bush's..dis 20 %
Lincoln's.......................................dis 50&10 %

Mortars and Pestles.
Iron...net

Mouse Traps.
Wood Choker....................℘ doz holes, 16 @ 18c
Round, Wire.......................℘ doz $1 50 to 2 00 net
Square, " ....℘ doz 2 00 to 2 50 net
Cage, " ....℘ doz 2 50, dis 10 %

Mowers, Lawn.
Excelsior...dis 25 %

Nails.................................10d $3 75 @ 3 90

Nail Pullers.
Capewell's Giant......................per doz $30 00 net

Nuts and Washers.
Nuts......................large, 6c ; small, 8c off list.
Washers...................large, 8c ; small, 10c off list.

Oil Stones.
Washita No. 1...℘ ℔ 22c
Washita Slips...℘ ℔ 45c
Washita No. 2...℘ ℔ 17c
Arkansas...℘ ℔ 1 25
Hindostan..........................℘ ℔ 6c dis 10&10 %
" Slips............................℘ ℔ 10c dis 10&10 %

Oilers.
Miller's Zinc.......................................dis 30 %
" Brass and Copper..................................dis 25 %
Olmsted's.............................new list dis 25&10 %
Broughton's......................................dis 25&5 %
Malleable...........................per doz $5 00 dis 10 %
Common Tin..dis 30 %
" Zinc..dis 30 %
" Brass and Copper..................................dis 30 %
Prior's...dis 30&10 %

Ox Shoes.
Concave.......................................℘ ℔ 13c net

Ox Balls.......................................dis 60&10 %

Pencils
Rope's Carpenters'..............................dis 30&10 %
Dixon's Lead...........................℘ gross $4·50 net
" Lumber...............................℘ gross 9·00 net

Picture Nails and Knobs.
Brass Head......................................dis 60&10 %
Richards' Patent..........................dis 40 @ 40&10 %
Judd's..dis 60&10 %

Pinking Irons...................per doz $2 75—dis 65 %

Planes.
Auburn Tool Co.'s...............................dis 30&10 %
Ensenore, Bench.....................................dis 50 %
Chapin's, 1st quality...........................dis 25&10 %
Chapin's 2d quality...........................dis 53⅓&10 %
Greenfield Tool Co..............................dis 25&10 %
"New York"..dis 40 %
Sandusky Tool Co., 1st quality......................dis 35 %
" " 2d " (Ogontz).................dis 50 %
Ohio Tool Co., 1st quality..........................dis 35 %
" " 2d quality (Sciota)....................dis 50 %
Owasco Tool Co., 1st quality....................dis 30&10 %
" " 2d quality......................dis 50 %
Howland's, 1st quality..........................dis 30&10 %
Bailey's Patent Adjustable......................dis 20&10 %
Plane Irons, Butcher's.................$5 50 to £ gold—new list
" Auburn Tool Co.'s.................................dis 25 %
" Chapin's......................................dis 10&10 %
" Greenfield Tool Co...................................net list
" Ohio Tool Co.......................................dis 10 %
" Spear & Jackson's.............5 50 to £ gold—new list
" Sandusky Tool Co..................................dis 10 %
Plow Bits, Greenfield Tool Co.......................dis 10 %

Pliers.
Button's Patent...................................dis 33⅓ %

Plumbs and Levels
Chapin's......................................dis 66⅔&10 %
Standard Rule Co.'s New Adjustable..............dis 60&10 %
Standard Rule Co.'s Non-Adjusteble...........dis 60&10&10 %
Stanley R. & L. Co.'s Pat. Adjustable...........dis 60&10 %
" " " Non-Adjustable...........dis 60&10&10 %
Pocket Levels...................................dis 50&10 %

Pulleys.
Hot House and Tackle............................dis 60&10 %
Jap'd Screw.....................................dis 60&10 %
Brass Screw.....................................dis 60&10 %
Jap'd Side......................................dis 60&10 %
" Clothes Line..................................dis 60&10 %
Hay Fork....................per doz $4 50 @ 5 00, dis 10 %

Pumps.
Douglas Cistern, etc........................new list dis 25 %
" S. & F..................................new list dis 20 %
Union Mfg. Co's. Cistern and Pitcher................dis 25 %
" " " Rams..dis 20 %
" " " Garden Engines................................dis 10 %
Cucumber (Burlingham & Purdy)—
6 ft. No. 3, with 12 ft. pipe.........................$4·00 net
6 ft. No. 1, with 12 ft. pipe..........................4·50 net
From 6 to 36 ft. add 20 cents per ft.
Pipe, 8c. per ft. ; Coupling, 20c. per ft.

Punches.
Belt or Drive.......................................dis 25 %
Spring..dis 20 %

Rail, Sliding Door.
Wrought Brass.............................℘ ℔ 40c., dis 10 %
Iron, Painted...................................dis 60&10 %

Rakes.
Cast Steel..dis 30 %

$8 00	9 00	10 00	11 00
8	10	12	14 teeth.

Malleable...dis 30 %

$5 00	5 50	6 00	6 50
9	11	13	15 teeth.

Razor Straps.
Evan's..dis 25&10 %
Genuine Emerson.....................................dis 25 %
Hunt's..dis 35 %
Chapman.......................................dis 10 @ 15 %
Torrey's..dis 10&10 %
Saunder's..net

Rivets.—Old Colony.
Iron and Tinned.....................................dis 30 %
In bulk..dis 7½ %
Copper Rivets and Burrs....................new list dis 30 %

Rivet Sets..net

Rods.
Stair.................................new list dis 33⅓ %
American Patent.....................................dis 30 %

Rollers.
Barn Door........................revised list dis 60, 10&10 %
Novelty...dis 10 %

Rope. Manufacturers' List.
Manila..........................½ inch and larger ℘ ℔ 16 c
" ....⅜ inch ℘ ℔ 16½c
" ....¼ and 5-16 inch ℘ ℔ 17 c
" Lath Yarn, Fine Tar'd...........................℘ ℔ 17 c
" Hay Rope..℘ ℔ 16½c
Sisal...........................½ inch and larger ℘ ℔ 13 c
" ....⅜ inch ℘ ℔ 13½c
" ....¼ and 5-16 inch ℘ ℔ 14 c
" Hay Rope..℘ ℔ 13½c

Rules.
Chapin's Boxwood..............................dis 66⅔&10 %
" Ivory...dis 50&10 %
Hubbard & Curtiss Mfg. Co.......................dis 60&20 %
Stanley Rule and Level Co.'s Ivory..............dis 50&10 %
" " " Boxwood..................dis 60&10&10 %
Standard Rule Co.'s Boxwood..................dis 60&10&10 %
" " " Ivory.....................................dis 50&10 %

Sad Irons.
....℘ ℔ 4c net
Sad Iron, Nickel Stand attached.......................℘ ℔ 9c

Sand Paper....dis 15 %
Beader & Adamson's (Flint) 00 to 1½..............$4 25 ℘ ream
" " " 2, 2½ & 3.................4 75 "
Assorted...4 75 "
Star...4 25 "
Emery...℘ ream $3 25
H. B. & M. Roman Flint......................℘ ream $6 50 @ 11 50
Cowdin Mfg. Co..................................dis 7½ @ 10 %
Diamond Flint, 00 to 1½..........................per ream $4 25
" " 2, 2½, 3 and assorted.................. " 4 75
" Emery Paper..........................per ream $6 50 to $11 50

Sash Cord.
Common...................................℘ ℔ 20 @ 22c. net
Silver Lake Flax...................................℘ ℔ 55c. net
" " Cotton...℘ ℔ 65c. net

Sash Locks.
Clark's, Nos. 1 and 2.............................dis 33⅓ %
Ferguson's..dis 33⅓ %
Norwich...dis 15 %
Walker's..list net

Sash Weights.
Solid Eyes..℘ ℔ 2½c

Sausage Fillers.
Perry's (P. S. & W.)................................dis 15 %

No.	1	0
℘ doz	$15 00	$21 00

Saw Frames......................................dis 10&10 %

Saw Rods..............................$10 list, dis 10&10 %

Saws.
Spear & Jackson's old pattern....................$4 50 to £ gold
Spear & Jackson's American Pattern..............$3·55 to £ gold
John Spear......................................$3 60 to £ gold
Am. Saw Co..new list
Perforated Cross Cuts, all kinds......................68c ℘ foot
Inserted Tooth......................................dis 10 %
All else..dis 12½ %
Disston's Circular..................................dis 20 %
" Mill...dis 25 %
" Cross Cut..dis 15 %
" other kinds......................................dis 12½ %
Livingston's Framed Wood............................dis 10 %
Livingston's Butcher and Kitchen....................dis 10 %
H. W. Peace's Circulars.............................dis 10 %
" Other kinds.......................................dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular............new list dis 15 %
Wm. McNeice's Patent Pole Pruning Saw...............dis 10 %
" " " Compass Saw.........................net.
E. M. Boynton's Lightning.....dis 40 % for immediate cash
" " Others......................................dis 15 %
Wheeler & Clemson Mfg. Co.'s Hand....................dis 15 %
" " " " Cross-Cut..........................dis 30 %

Saw Sets.
Stillman's Genuine...................℘ doz $5·00—dis 10 %
" Imitation...................℘ doz 3·25—dis 10&10 %
Aiken's Pattern......................℘ doz 7·00—dis 25 %
Hart's Patent.......................................dis 15 %
Nash's..dis 15 %
Bemis'..dis 20&10 %
Aiken's Genuine......................℘ doz $15·00—dis 25 %
Hotchkiss'............................℘ doz 5·50—dis 10 %
Common Lever....................per doz $2 00—dis 10&10 %
Leach's...dis 15 %

Scales.
Hatch...dis 25 %
Tea...dis 25 %
Turnbull's..dis 15 %
Brown's...dis 25&5 %
Fairbanks'...........................new list dis 15 @ 20 %
Howe's..dis 15&5 %
Shattuck's Counter and Union........................dis 15 %
Chatillon's Grocers'................................dis 25 %
Eureka..dis 25 %
Scale Beams.....................................dis 25&10 %
No. 1 800 to 1200 lbs..............................90c ℘ cwt
No. 2 " ....75c ℘ cwt

Scrapers.
Box, 1 Handle......................per doz $6·25, dis 10 %
" 2 " ....per doz 7·50, dis 10 %
Foot..dis 60 & 10 %
Ship..per doz $3 00 net

Screws.
American list of Jan. 1, 1874.
Flat Head Iron....................................dis 52½ %
Round Head Iron.....................................dis 50 %
Flat Head Brass...................................dis 52½ %
Round Head Brass....................................dis 50 %
Round Head Silver Capped............................dis 35 %
Hand Rail.......................................dis 55&10 %
Coach or Lag...............................dis 30&10 @ 40 %
Coach, Patent Gimlet Point..........................dis 15 %
Bed...list net
Japanned..dis 40 %
English—Nettlefold & Chamberlain's Flat Head Iron........dis 52½&10 %
Machine—Flat Head, Iron.............................dis 60 %
" " Brass...dis 10 %
Round Head, Iron...............................dis 55 %
" " Brass...net
Bench—Iron, Wilson's................................dis 20 %
" —Wood...dis 15 %
Hand..dis 25&10 %
Jack—Bell Bottom....................................dis 15 %

Scythes.
Blood's German Steel, Grass.........................℘ doz $9 00
" Cast " " ....℘ doz 10 00
" Silver " " ....℘ doz 11 00
" German " Grain.............................℘ doz 13 00
" Cast " " ....℘ doz 14 00
" Red Rover...12 00
" Young America..9 50
" Silver Clipper..12 63
Scythe Snaths.......................................dis 20 %

Sieves.—Mann's Patent...............................dis 20 %

Shears.
Cast Steel......................................dis 65&10 %
Cast Iron.......................................dis 25&10 %
Conn. Cutlery Co., new brand........................dis 60 %
Seymour's.......................................dis 60&10 %

Shovels and Spades.
Ames................................new list dis 12½ %
Rowland's...dis 30 %
Old Colony.............................new list dis 10&5 %
Middleboro' Shovel Co.................new list dis 12½ %

Shovels and Tongs.
Iron Head...list net
Brass Head...dis 5 %
Polished Steel.............................new list dis 15 %

Skates.
Barney & Berry's....................................dis 25 %
N. Y. Club..℘ pair $2·75
B. & B. Club.." 3·50
All Clamp.." 4·25
Rink..." 8·00

Slates.
Square Frames, Round Cornered, by case..........dis 65&10 %
Less than a case................................dis 55&10 %
Oval Frames, by case.......................dis 40 @ 40&10 %
Less than a case....................................dis 30 %

Spoke Shaves.
Iron..dis 20&10 %
Wood..dis 30 %
Bailey's..dis 10&10 %

Spoons.
Iron...............................new advanced list, dis 10 %
By the case...dis 20 %
Britannia.......................................dis 45&10 %
Rogers & Bro., A 1.......................dis 40, 10&5 %, cash
Derby Silver Co..................................dis 50 & 5 %
German Silver..........................revised list dis 30 %
Tinned (P. S. & W.)—
Teas...$1·50 ℘ gross, net
Tables...2·75 " net

Stocks and Dies.
....dis 15 %

Stove Polish.
Gem...............................℘ gross $5 00, dis 15 %
Joseph Dixon's..............................℘ gross, 6 00
Gold Medal........................℘ gross $6 00 dis 15 %

Squares.
Steel....................dis 50 % ; full cases, dis 50&10 %
Iron.....................dis 60 % ; full cases, dis 50&10 %
Nickel Plated.......................add $2 50 @ $4 00 ℘ doz net
Try Squares and T Bevels........................dis 45&10 %
Star Try Squares and Bevels.........................dis 30 %

Tacks.
Full Weight American Iron........................dis 45&7½ %
Half Weight American Iron......................dis 72½&7½ %
Carpet, new list...................................dis 7½ %
Brads American Half Weight.......................dis 50&7½ %
Finishing Nails....... ⅛ ⅜ ⅝ 1 1¼ in. and over
℘ ℔.......25c 20c 18c 14c 12c dis 7½ %
Trunk and Clout....... ⅛ ⅜ ⅝ 1 1¼ in. and over
℘ ℔.......25c 20c 18c 14c 12c dis 7½ %
Copper Tacks..............................℘ ℔ 50c—dis 7½ %
Iron Shoe Nails, ℘ ℔ 4-8 and longer, 9½c ; 3½-8, 10c..............dis 7½ %
Double Pointed..........................new list dis 33⅓&10 %

Tapes, Measuring.
American Flask and Cap Co...........................dis 20 %
Eddy's..dis 20 %

Thermometers.
Tin Case...dis 50&5 %

Toe Calks.
....℘ ℔ 13c net

Tobacco Cutters.
Champion..dis 20 %
Peck, Stow & Wilcox.................................dis 10 %
Morse's.........................℘ doz $12·00—dis 10&10 %

Tinners' Tools and Machines.
P. S. & W..list net

Traps.
Newhouse..dis 20 %
Hotchkiss.......................................dis 20&10 %
Peck, Stow & Wilcox.................................dis 30 %
Blake's Patent.............................new list dis 25 %

Trowels.
Lothrop's Brick and Plastering......................dis 10 %
Disston's Plastering..............................dis 12½ %
Disston's Brick...................................dis 12½ %
Rose's Brick...dis 5 %
Brades' Brick..gold, net
Worrall's Brick and Plastering......................dis 20 %
Garden..dis 25 %

Tryers.
Butter and Cheese...................................dis 25 %

Ventilators, Double Cone.
Keystone Portable Forge Co..........................dis 25 %

Vises.
Trenton Vises, Solid Box.
30 to 160 lbs..16c
160 and over...15c
Peter Wright's..............................℘ ℔ 15½c. gold
Wilson's Solid Box..................................dis 15 %
30 to 160 lbs..18c
160 and upward...22c
Wilson's Parallel...................................dis 30 %
Backus & Union, Parallel............................dis 25 %
Buffalo, Parallel..........................new list dis 20 %
Fisher & Norris' Double Screw Parallel..........dis 15&10 %
Trenton Parallel....................................dis 15 %
Merrill's Parallel..................................dis 15 %
Parker's..dis 20 %
Bonney's Saw Filers.................................dis 20 %
Stearn's Saw Filers.................................dis 30 %

Wheel Barrows.
Pugsley & Chapman—Canal.............................dis 20 %
Coal, Garden and Stone..............................dis 20 %

Wheel Heads.
Brass Bushed............................per doz $3 50 net

Well Wheels.
Revised list....................................dis 60&10 %

Wire.
Brass and Copper..list
Bright and Annealed.........Nos. 0 @ 18 dis 37½ @ 42½ %
" " " 19 @ 26 dis 47½ @ 52½ %
" " " 27 @ 36 dis 52½ @ 57½ %
Coppered.....................Nos. 0 @ 18 dis 27½ @ 32½ %
Galvanized, Nos. 0 to 6...................market list dis 2½ %
Galvanized, Nos. 7 to 18..................market list dis 12½ %
Tinned..dis 20 @ 25 %
Cast Steel..5 @ 10 %
Tinned Broom Wire...............................dis 25 @ 30 %
Galvanized Telegraph, Nos. 8 and 9.......℘ ℔ 8½c @ 9½c
" " 10 and 11.......℘ ℔ 9½c @ 10½c
" " 12.......℘ ℔ 10c @ 11c
Annealed Fence, Nos. 8 and 9...............dis 37½ @ 42½ %
" Grape, " 10 to 14...............dis 37½ @ 42½ %
Fence Staples.................................℘ ℔ 8½ @ 9 %
Stubs' Steel Wire.............................$7 00 to £ gold
Judd's Picture Wire.................................dis 50 %

Wrenches.
American Adjustable.................................dis 45 %
Baxter's Adjustable "S".............................dis 20 %
" Diagonal..dis 20 %
Collins & Co.'s.....................................dis 45 %
Coes' Genuine....................................dis 40&5 %
" Pattern (Wrought).................................dis 50 %
" " (Malleable).................................dis 60&10 %
Lindsay's Patent....................................dis 25 %
Taft's Pattern......................................dis 70 %
Davis' Patent Duplex.......................new list dis 25 %
Bemis & Call's Patent Combination.................dis 20&5 %

Wringers.
Providence ... ⅌ doz $58 00
Universal—Extra ... ⅌ doz 58 00
Novelty ... ⅌ doz 58 00
Sherman ... ⅌ doz 58 00
Reliance ... ⅌ doz 58 00
Monitor ... ⅌ doz 58 00
King ... ⅌ doz 58 00
Crown ... ⅌ doz 58 00
Eureka ... ⅌ doz 58 00
Independent ... ⅌ doz 58 00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 5 @ 10 %.
COMMON STAMPED WARE, &C.
Bucket Covers.
Quarts ... ½ 1 2 3 4
Inch ... 4½ 5 3-16 6 5-16 6⅜ 7 11-16
Per gross ... $2·00 2·60 3·40 4·25 5·75
Quarts ... 6 8 10 12
Inch ... 8⅜ 9⅛ 9⅜ 10 9-16
Per gross ... $7·00 8·00 8·50 11·50
Cake Box Covers.
Small. Medium. Large.
Inch ... 11⅛ 12⅛ 13⅛
Per gross ... $15·00 18·00 22·00
Pot Covers.
Inch ... 7⅜ 8⅛ 8⅜ 9⅛ 9⅜ 10⅛
Per gross ... $5·75 6·00 6·25 6·75 7·25 8·25
Inch ... 10⅜ 11⅛ 11⅜ 12⅛ 12⅜ 13⅛
Per gross. $8·75 9·50 10·00 13·00 13·75 16·50
Pie, Dinner or Scolloped Plates.
Inch ... 6 7 8 9 10 11
Per gross ... $4·00 4·50 6·00 6·50 8·50 10·50
Deep Pie Plates.
Inch ... 9 10
Per gross ... $8·50 10·50
Jelly Cake Pans.
Inch ... 9 10
Per gross ... $7·50 10·00
Coffee Pot Covers.
Plain ... 1½ 2 3 4 5 6 qts.
Inch ... 3 3⅝ 3⅞ 4½ 5
Per gross ... $1·15 1·40 1·60 2·00 2·75 3·00
Rimmed ... 2⅞ 3 3⅜ 4 4½ inches.
Per gross ... $2·25 2·50 3·00 3·50 4·00
T. K. Breasts only.
Inch ... 7½ 8 8½ 9 9½ 10 10½ 11 11½
Per gro. $6·00 6·50 6·75 7·25 7·75 9·50 10·00 12·00 13·00
Grater Plates.
Sheet ... ½ ⅝ 1
Per gross ... $3·00 6·00 11·50
Scolloped Cake Pans.
Small. Large.
Without Tubes ... per gross, $8·00 11·50
With Tubes ... " 10·50 14·00
Stamped Square Pans.
No. ... ½ 1
Per gross ... $7·50 14·50
Common Square Pans (One Sheet).
Per gross ... $12·50
Milk Skimmers (Plain or Pierced).
Per gross ... $4·00
Lettered Plates.
Inch ... 5½ 6
Per gross ... $3·25 4·00
Steamer Bottoms.
Add $1 per gross, or 10c. per doz. to list of Pot Covers.
Tin Stove Pipe Rings.
Inch ... 4 4½ 5 5½ 6 7
Plain ... per gro. $4·50 5·00 5·50 6·00 6·50 7·50
Jap'd or Burn'd.. " 6·00 6·50 7·00 8·00 8·50 10·00
Coffee Boiler Lips.
Small. Large.
To Rivet ... per gross, $0·80 1·10
To Solder ... 1·25
Plain Stamped Water Dippers.
½ pint. Pint. Quart. 2 quarts. 2½ quarts.
Per doz ·90 1·15 1·50 1·85 2·50
RETINNNED WARE, dis 20 @ 25 %.
Retinned Milk Pans.
Qts... ½ 1 1½ 2 3 3½ 4 5 6 8 10 12
⅌ doz. 1·20 1·50 1·75 2·00 2·25 2·75 3·15 3·50 3·85 4·75 5·25 5·75
Dipper Bowls, Plain Stamped ... dis 20 @ 25 %
Pints ... ½ 1 Quarts ... 1 2 2½
Per doz. ·50 ·75 Per doz... 1·00 1·25 1·75
Dipper Bowls, Retinned ... dis 20 @ 25 %
Pints ... ½ ¾ 1 Quarts ... 1 2 2½
Per doz. ·75 ·90 1·05 Per doz .. 1·40 1·75 2·25
Pans.
Dish Pans, Tinned ... dis 20 @ 25 %
Quarts ... 7 8 10 14 17 21 30
Per doz. ... 8·50 9·50 11·00 13·00 16·00 19·00 26·00
JAPANNED TIN WARE.
Cannisters, Common ... dis 10 %
Pound ... ½ 1 2 3
Per doz ... $1·10 1·00 2·50 3·2
Canisters, Hinged ... dis 10 %
Pound ... 1 2
Per doz. ... $1·75 2·75 3·40 3·75 4·50
Candlesticks, Japanned ... dis 10 %
No ... 1 2
Per gross ... $8·00 7·00
Cake Boxes, Round ... per nest, $3·25, dis 10 %
" Square ... per nest, 4·25, dis 10 %
Chamber Pails, Japanned (Smith, Burns & Co.)...dis 10 %
Nos ... 2 3 4 5
Green, per doz ... $8·00 9·00 10·50 12·50
Oak ... $9·50 10·50 12·00 13·50
Dust Pans, Corrugated ... per gross, $22·00, dis 10 %
Box Graters ... per gross, $4·00, dis 10 %
Molasses Cups ... dis 10 %
Pint ... ½ 1 2
Per doz ... $1·25 ·50 2·2
Lunch Boxes, per doz ... 7 in $2·00; 8 in. $2 50; dis 10 %
Pepper Boxes Japanned ... dis 10 %
Per gross ... Small, $3·00; Large, $4·00
Toy Banks, House ... dis 0 %
Tea Trays, American Tea Tray Co ... dis 15 %
No ... 1 2
Per gross ... $7·00 5·50
Toy Banks Gothic ... dis 10 %
No ... 1
Per gross ... $5·50
Toy Cups, Straight ... dis 10 %
No ... 1 2 3
Per gross ... $4·00 3·50 3·50
Toy Cups, Flaring... No. 1, $4·25; 2, $3·70 ⅌ gross, dis 10 %
Toy Pails, Covered ... dis 10 %
No ... 1
Per gross ... $4·50
Toy Rattles ... per gross, $2·25, dis 10 %
Trunks, Wire Handled ... per nest (5) $1·50, dis 10 %
Spittoons, Tin ... per gross. No. 2, $30, No. 3, $27, dis 10 %
PLANISHED TIN WARE.
Planished Coffee Pots, Round ... dis 25 @ 30 %
Each ... ·60 ·75 ·85 ·95 1·15 1·25 1·30 1·40
Pints ... 1 2 3 4 5 6 7 8
Planished Tea Pots, Round ... dis 25 @ 30 %
Each ... ·70 ·80 ·95 1·05 1·25
Pints ... 2 3 4 5 6
Planished Tea Pots, Oval ... dis 25 @ 30 %
Each ... ·70 ·80 ·90 1·05 1·15 1·40 1·75
Pints ... 1 2 3 4 5 6 8
Planished Pepper Boxes, No. 1 ... per doz., $1·52
Planished Flour Dredges, No. 3, $2·10; 4, 2·45 ⅌ dozen.
Planished Round Coffee Biggins ... dis 25 %
Pints ... 2 3 4 5 6 8
Each ... $1·00 1·10 1·20 1·40 1·60 2·00
Planished Oval Coffee Biggins ... dis 25 %
Pints ... 2 3 4 5 6 8
Each ... $1·15 1·25 1·40 1·60 1·80 2·25
Planished Oval Chafing Dishes, Imperial Covers..dis 25 %
Inch ... 10 12 14 16 18 20 22 24
Each ... $3·85 5·00 6·25 7·60 9·00 11·50 15·00 16·50
Planished Oval Chafing Dishes, Low Covers ... dis 25 %
Inch ... 10 12 14 16 18 20
Each ... $3·25 4·35 5·20 6·20 7·80 9·25
Planished Low Dish Covers ... dis 25 %
Inch ... 10 11 12 14 16 18 20
Each ... $ ·70 ·80 1·00 [illegible] 1·50 2·00 2·75
Planished Imperial Dish Covers ... dis 25 %
Inch ... 10 11 12 14 16 18 20 22 24
Each ... $1·55 1·70 2·00 2·60 3·15 3·45 4·60 5·45 6·30
Planished Etnas, on Stands ... dis 25 %
Pints ... 1½ 2 3 4 5
Each ... $0·90 1·00 1·20 1·50 1·75
Planished Liquor Mixers ... dis 25 %
Nos ... 0 1 2
Per doz ... $2·00 2·10 2·45
Planished Oval Melon Molds ... dis 25 %
Nos ... 2 3 4 5 6 7 8 9
Each ... $·60 ·65 ·70 ·80 ·90 1·00 1·15 1·35
Planished Oval Tumbler Warmers ... dis 25 %
To fit 1, 2, 3, and 4 O. G. Urns ... each, $2·50
Planished Oval O. G. Urns ... dis 25
Nos ... 0 1 2 3 4 5 6 7 8
Each ... $4·90 5·45 6·30 7·00 7·75 9·25 11·25 12·50 15·00
Planished Round Urns ... dis 25 %
Nos ... 0 1 2 3 4 5 6 7
Each ... $4·20 4·85 5·45 6·30 7·75 9·00 11·00 14·25
Planished Round Oyster Dishes, (Complete) ... dis 25 %
Nos ... 1 2
Each ... $2·10 2·80
Planished Oyster Dish Plates ... dis 25 %
Nos ... 1 2
Each ... $0·25 0·30
Oyster Dish Covers ... dis 25 %
Nos ... 1 2
Each ... $0·30 0·35

Tea Pot Handles—P. S. & W ... dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small 4½ inches ... per gross, $11·50
No. 2, Medium, 5⅛ " ... " 12·50
No. 3, Large, 6⅛ " ... " 13·50
No. 4, Ex. Large, 7½ in., for Wash Pitchers &c ... " 18·00
Stow's Patent. New Pattern.
No. 25, Small, 4½ inches ... per gross, $11·50
No. 35, Medium, 5⅛ " ... " 12·00
No. 45, Large, 6⅛ " ... " 13·00
Solid Iron. Tin Tipped.
No. 10, Small, 4½ inches ... per gross, $9·00
No. 15, Medium, 5⅛ " ... " 9·50
No. 20, Large, 6⅛ " ... " 10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W.
No. 12, Bronzed and Tin-Tipped ... per gross, $18·50
Saucepan Handles, Of Best Malleable Iron.
P. S. & W ... dis 20 %
Japanned.
No. 1, 5½ inches long ... per gross, $3·50
No. 2, 6 " ... " 3·75
No. 3, 6½ " ... " 4·00
No. 4, 7½ " ... " 4·25
No. 5, 8 " ... " 4·50
No. 6, 9 " ... " 4·75
Tinned.
No. 1, 5½ inches long ... per gross, $4·25
No. 2, 6 " ... " 4·50
No. 3, 6½ " ... " 4·75
No. 4, 7½ " ... " 5·25
No. 5, 8 " ... " 5·5
No. 6, 9 " ... " 5·7
Japanned ... per lb., ·1
Tinned ... " ·2

Iron Kettle Ears (P., S. & W.) ... dis 45 %
Half gross pairs in a package.
Tinned.
Nos ... 1 2 3 4 5 6 7 8
Per gross pairs.. 88c $1·00 1·50 1·75 2·10 2·75 3·50 4·75
Black.
Nos ... 1 2 3 4 5 6 7 8
Per gross pairs... 75c 88c $1·35 1·50 1·75 2·25 2·75 4·00
Tinned Tea Kettle.
Nos ... 4 5 6
Per gross pairs ... $1·75 2·10 2·75
Extra Heavy Tinned Kettle Ears—French Pattern.
Nos ... 1 2 3 4 5 6 7
Per gross pairs ... $1·00 1·25 1·50 1·75 2·25 2·75 3·50
Malleable Iron Kettle Ears for Coal Hods, &c.
P., S. & W ... dis 20 %
No. 10 Small ... ⅌ ℔, Tinned, 20c; Black, 16c
No. 20 Medium ... ⅌ ℔, " 20c; " 16c
No. 30 Large ... ⅌ ℔, " 20c; " 16c
No. 40 Extra Large ... ⅌ ℔, " 20c; " 16c
In cases of 100 lbs. each.
Milk Can or Boiler Handles—(P. S. & W.) 4½ in..dis 25 %
Plain, 8c.; Japn'd, 9c.; Tinned, 16c. per lb.; Malleable Clips or Ears to match, Tinned ... 20c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.) ... dis 35 %
Plain with drilled holes, per lb ... 9c
Plain with Cast " " ... 8c
Plumbers' Scrapers—(P. S. & W) ... dis 25 %
Extra quality, length 6 in., per doz ... $4·00

METALS.

IRON.—Duty: Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1½ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb

Pig Iron—AMERICAN.
Foundry No. 1 ... ⅌ ton, $30 00 @ 31 00
Foundry No. 2 ... " 28 00 @ 29 00
Gray Forge ... " 25 00 @ 28 00
White and Mottled ... "
SCOTCH.
Coltness ... "
Glengarnock ... " 36 50 @ 37 00
Eglinton ... " 34 50 @ 35 00
Summerlee ... "
Bar Iron.
Am. Refined, at mill ... ⅌ ℔ 3c
Rails.
Welsh, gold ... ⅌ ton, 48 00 @ 50 00
American, at works, currency ... " @ 55 00
Old Rails, currency ... " 33 00 @ 34 00
Scrap.
Wrought Scrap ... " 35 00 @ 37 00
Bar Iron from Store.
Common Iron.
⅜ to 2 in. round and square ... ⅌ ton, $ 65 00
⅝x9-16 in " " ... " 70 00
½ in. " " ... " 72 50
2⅛ to 3 in. " ... " 70 00
1 to 6 in. wide x ⅜ and 1 in thick ... " 65 00
1¼ to 6 in wide x ¼ & 5-16 in. thick ... " 70 00
1 and 1⅛ in. x ¼ and 5-16 ... " 72 50
Swedish Iron
1⅛x⅜ and ½ ... " 150 00
1⅛x⅜ to ⅝, and ⅜ square ... " 145 00
1⅛ to 5x⅜ to ⅜ and ⅜ to 2-in. square ... " 140 00
6 to 8x⅜ and ½ ... " 155 0
Refined Iron.
⅜ to 2 in. round and square ... " 67 50
1 to 6 in. wide x ⅜ to 1 thick ... " 67 50
1¼ to 6 in. wide x ¼ and 5-16 thick ... " 72 50
1 and 1⅛ x ¼ and 5-16 ... " 72 50
Large Rounds.
2⅛ to 2⅞, round and square ... " 77 50
3, 3⅛ and 3½ in ... " 82 50
3⅝ and 4 in ... " 90 00
Rods—⅝ and 11-16, round and square ... " 70 00
½ and 9-16, " " ... " 72 50
7-16, " " ... " 80 00
⅜, " " ... " 85 00
5-16, " " ... " 90 00
¼, " " ... " 95 00
3-16, " " ... " 127 50

Sheet Iron.

	Common American and English.	R. G. American.	R. G. English.
Nos. 10 to 20 ... ⅌ ℔	4½ @ 4⅝c	5⅛c	6c
21 to 24 ... "	4⅞ @ 5c	6c	6c
25 to 26 ... "	5 @ 5⅛c	6c	6c
27 ... "	5⅛ @ 5⅝c	6⅛c	6⅛c
28 ... "	5⅝c	6⅛c	6⅝c

Galvanized, 1 to 20, prime, ⅌ ℔ 10; 2d quality ... ⅌ ℔ 9c
" 21 to 24 " " 11 " ... " 10c
" 25 to 36 " " 12 " ... " 11c
" 27 " " 13 " ... " 12c
" 28 " " 14 " ... " 13c
Patent Polished ... " 15 @ 16c
Russia, Nos. 8 to 16 ... ⅌ ℔ 18c
" Stained, No. 1 ... " 17c
Belgian ... " 12c
One piece Corrugated Sheet Iron Elbows.
CHARCOAL IRON
4½ 5 5½ 6 7 inch.
$2·50 3·50 4·50 5·25 6·50 per doz.
RUSSIA IRON.
5 5½ 6 7 inch.
7·00 9·50 12·00 14·00 per doz.
BABBITT METAL.
Excelsior ... cash, dis 10 %
No ... 1 2 Extra.
10c 12c 15c 20c @ 25c

COPPER—Duty: Pig, Bar and Ingot, 5c.; old copper 4 cents ⅌ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem. All subject to a reduction of 10 per cent.
American Ingot ... ⅌ ℔ 22c
English " ...
SHEATHING, BRAZIERS COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot ... 35c ⅌ ℔
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot ... 38c. "
Braziers Copper, 12 oz. per square foot and lighter ... 41c. "
Circles less than 84 inch in diameter ... 38c ⅌ ℔
Circles, 84 inch diameter and over ... 41c. "
Segment and Pattern Sheets ... 38c. "
Locomotive Fire Box Sheets ... 35c. "
Sheathing Copper, over 12 oz. per sq. ft ... 31c. "
" " 12 oz. ⅌ sq. ft. and lighter ... 41c. "
Bolt Copper ... 35c. "
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.
TINNING.
14x48, by the case ... 8c. ⅌ sheet
14x48, less than case ... 10c. "
Boiler Sizes, 7 and 8 inch ... 12c. "
" 9 inch ... 15c. "
Other sizes not larger than 30x60 ... 2½c. ⅌ sq.
Larger than 30x60 ... 5c. "
Copper Bottoms, 32 @ 33c. ⅌ ℔ ... net
O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier ... 36c. By the case, 35c. ⅌ ℔
12 oz. and lighter ... 39c. " " 38c. "
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier ... 38c. By the case, 37c. ⅌ ℔
(And all sizes not over 30 inches wide.)
30x60
14 and 16 oz. and heavier ... 40c. ⅌ ℔
12 oz ... 43c. "

LEAD—Duty: Pig, $2 per 100 lbs.; old Lead, 1½ cent per lb.: Pipe and Sheet, 2¼ cents per lb. All subject to a reduction of 10 per cent.
Spanish ... 6¼ @ 6⅜c gold
German Refined ... 6¼ @ 6⅜c gold
English ... 6¼ @ 7c gold
American ... 6c gold
Bar ... dis 20 % ... 8½c.
Pipe ... dis 20 % ... 9c.
Tin Lined Pipe ... dis 10 % ... 16½c.
Sheet ... dis 10 @ 20 % ... 9c.
Shot ... dis 30 %. Drop, 9c.; Buck, 9½c.
Solder ... No. 1, 15 @ 15½c; No. 2, 13½ @ 14c

STEEL—Duty: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.
Tool ... 15 @ 16c
Spring ... 10c
Homogeneous ... 12½c
Tire ... 12½ @ 13½c
Machinery (round and square) ... 10 @ 11c
File ... 11c
Sheet ... 14 @ 16c
Saw Plate, mill and mulay ... 14 @ 16½c
Saw Plate, gang and X cut ... 13 @ 14c
" circular as to size ... 18 @ 30c
Chrome Steel.
Tool ... ⅌ ℔ 20 @ 21c
Tool, extra fine ... " 40 @ 75c
Spring ... ⅌ ℔ 12c and upward
Machinery ... ⅌ ℔ 14c.
Hammer ... " 15c.
Gun or Homogeneous ... " 16c
English Steel.—payable in gold, dis 5 % cash.
" Best Cast ... ⅌ ℔ 18c
" Extra Cast ... " 19c
" Round Machinery, Cast ... " 11½c
" Swaged, Cast ... " 18c
" Best Double Shear ... " 18c
" Blister, 1st quality ... " 13½c
" " 2d quality ... " 11½c
" " 3d quality ... " 10½c
German Steel, Best ... " 11½c
do 2d quality ... " 10½c
Sheet Cast Steel, 1st quality ... " 18c
" " 2d quality ... " 16c
" " 3d quality ... " 14c
File Steel, Flat and ½ Round ... " 12½c
" Square and Round ... " 13c
" Mill ... " 13½c
" Taper to 4 inch ... " 17c
" Taper 8 and 3½ inch ... " 18c

SPELTER—Duty: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.
Silesian, cash ... 6¾ @ 7c., gold
American " ... 7¾ @ 11c., currency
TIN—Duty: Plates, Sheets, Tagger and Terne, 15 per cent. ad val.; Electro-galvanized Plates, 2 cents per ℔; Manufactures of, not enumerated, 35 per cent. ad val. —all subject to a reduction of 10 per cent. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.
Banca ... ⅌ ℔ 26c., gold
Straits ... ⅌ ℔ 24c., gold
English ... ⅌ ℔ 21½ @ 23c., gold
CHARCOAL TIN PLATE.
I C 10x14, Prime Charcoal ... 11·00 to 11·25
12x12, " ... 11·75
14x20, " ... 12·00
I X 10x14, " ... 13·50
12x12, " ... 14·00
14x20, " ... 14·50
D C 12½x17 " ... 10·75
D X 12½x17 " ... 13·00
For each additional X add ... 2·25
COKE TIN PLATE.

	Best	2d Quality.	Ordinary.
I C 10x14	$10·50 @ 11·00	9·50 @ 10·00	9·00 @ 9·50
I C 12x12	11·00	10·50	
I C 14x20	11·25	10·50	

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$10·00 @ 10·50	9·50 @ 10·00	8·00 @ 9·00
I X 14x20	12·75		
I C 20x28	21·00 @ 21·50	20·00 @ 21·00	17·00 @ 19·50
I X 20x28	26 00		
I C 20x200 ft.	25·00		

ZINC.—Duty: Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ⅌ ℔. All subject to a reduction of 10 per cent.
Sheet ... cask 9¼c
" ... open 9¾c

Paper Stock, Old Metals, &c.

(*Dealers' Selling Prices.*)
Canvas linen ... 6¾ @
" cotton, No. 1 ... 6⅞ @ 7
" " No. 2 ... @ 5
White linen rags, No. 1 ... 6⅞ @
" " No. 2 ... 4½ @
Colored ... 2⅞ @
Mixed woolens ... @ 2½
Soft woolens ... @ 5½
Gunny bagging ... 1⅞ @ 2
Jute Butts ... 2¼ @ 2⅜
Kentucky bagging ... 5¼ @ 5½
Book stock ... 4 @ 4½
Waste paper and scraps ... 1 @ 1½
Rope cuttings ... 1½ @ 3
Kentucky Bale rope ... 4 @ 4½
Oakum junk, No. 1 ... 5½ @ 5⅝
" No. 2 ... @ 4
Grass rope ... 3½ @ 3⅜
Tarred Shaking ... 1½ @
White Collar Cuttings, all paper ... 7 @
" " " muslin lined ... 5 @
" Envelope " ... 7 @
Hard White Shavings, No. 1 ... 6½ @
Soft " " No. 1 ... 6 @
White Shavings, No. 2 ... 5½ @ 6
Mixed Shavings, part white ... 4 @ 4⅜
Imperfections, No. 2, best folded sheets ... 5 @
" " 1, Heavy Stock ... 4½ @ 5
Book Stock, Mixed ... 3½ @ 4
" " No. 2, light ... 2 @ 2¼
Prints ... 1½ @ 2
Pure Manilas ... 2
Bogus Manilas and Hardwares ... 1 @ 1⅜
Commons ... 1 @
Binders' Board Cuttings ... 1⅞ @ 2
Straw Board Cuttings ... 1½ @ 1⅜
Old Metal.
Copper ... @ 19
Yellow metal ... 14 @ 15
Brass ... 13 @ 14
Heavy Composition ... 17 @ 18
Old lead, solid ... 6 @ 6½
Tea lead ... 4½
Wrought iron ... 1½ @ 1⅞
Sheet iron ... 0¾ @
Cast iron ... 1 @ 1½
Machinery iron ... 1¼ @
Zinc ... 5
Pewter, No. 1 ... 17
" No. 2 ... 10 @ 12
Spelter ... 5½ @ 6

Paints, Oils, etc.

Paints.
Black, lamp—Coach Painters ... ⅌ ℔ 20c
" " Ordinary ... 6c
" Ivory Drop, fair ... 15c
" " best ... 26c
Black Paint, in oil ... kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best ... 50 @ 75c
" " " in oil ... 35 @ 65c
" Chinese, dry ... 83c
" Ultamarine ... 25 @ 30c
Brown, Spanish ... 1½c
" Van Dyke ... 9c
Carmine, 40 ... $12 00
Green, Chrome ... 15 @ 23c
" " in oil ... 18 @ 25c
" Paris ... good, 30c; best, 40c
" " in oil ... " 30c " 45c
Mineral Paints ... 1½ @ 4c
Orange Mineral ... 14½c
Red Lead, American ... 9½c
" " English ... 10½c
" Venetian (N. C.) dry ... 2¼c
" " in oil ... asst'd cans, 11c; kegs, 8½c
" Indian, dry ... 10c
Rose Pink ... 13c
Sienna, American, Raw ... 4c
" Burnt ... 4½c
" " in oil ... 16 @ 26c
" Raw " ... 15 @ 25c
Umber, Burnt ... 4 @ 8c
" " in oil ... 16 @ 21c
" Raw ... 3½ @ 7½c
" " in oil ... 16 @ 22c
Vermillion, Chinese ... $1 92
" English ... 1 90
" Trieste ... 1 65
" American, Common ... 23c
White Lead, American, pure dry ... 10½c
" " in oil ... 11½c
White, Paris, English, prime ... in bbls. 2¼ @ 2½c
Yellow Ochre, French ... 2¼ @ 2½c
" " in oil ... asst'd cans, 11c; kegs, 8½c
" " Vermont ... in casks 1½c
" Chrome ... 17 @ 27c
" " in oil ... 18 @ 28c
Zinc White, American No. 1 dry ... 9c
" " 1, in oil ... 11c
" French (Paris) ... 11 c
" " in oil ... 12 c
Oils.
Linseed Raw ... ⅌ gal. casks, 87c. bbls, 88c
" Boiled ... " 91c. " 93c
Whale, Crude ... "
" Bleached Winter ... "
Sperm, Crude ... " 1·65
" Winter unbleached ... " 1·85
" " Bleached ... " 1·90
Seal, Extra Refined ... "
Lard, Pure Winter ... "
" Spring ... " 1·00
Cotton Seed, Crude ... " 60c
" Southern Yellow ... " 65c
" White ... "
Neatsfoot, Winter ... 70c @ $1·10
Natural Lubricating ... 38c @ 40c
Sundries.
Asphaltum ... 9c
Benzine ... ⅌ gal. 16c
Chalk ... 1½c
" Block ...
Dryer, Patent, Am'n ... ass't cans, 10½c.; kegs 9c
" " English ... " 11c.; " 9c
Flocks ...
Frostings ... 50c
Glue, White ... 33 @ 47c
" Sheet ... 20c
Glaziers' Points, Zinc ... 9c
Gum, Copal ... 36c
" Damar ... 25c
" Shellac, English ... 60c
" " dark ... 56c
Litharge ... 10c
Pumice Stone, selected Lumps ... 4 @ 6c
" powdered ... 4c
Putty in bladders ... 3½c
" in bulk ... 3c
Rotton Stone, soft, English ... 8c
Spirits Turpentine ... 36c
Whiting, Spanish ... 1c
Glass.
French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	
6 x 8 to 10 x 15	$10·25	$9·25	$8·75	$8·00
11 x 14 to 16 x 24	12·00	11·00	10·00	9·50
18 x 22 to 20 x 30	15·00	13·50	12·00	10·50
15 x 36 to 24 x 30	17·50	15·25	12·50	
26 x 28 to 24 x 36	18·25	16·00	13·25	
26 x 36 to 26 x 44	20·00	18·00	14·50	
26 x 46 to 30 x 50	21·00	19·00	15·25	
30 x 52 to 30 x 54	22·50	20·25	16·25	
30 x 56 to 34 x 56	24·50	21·75	19·00	
34 x 58 to 34 x 50	26·00	24·50	21·50	
36 x 60 to 40 x 60	30·50	27·00	24·50	

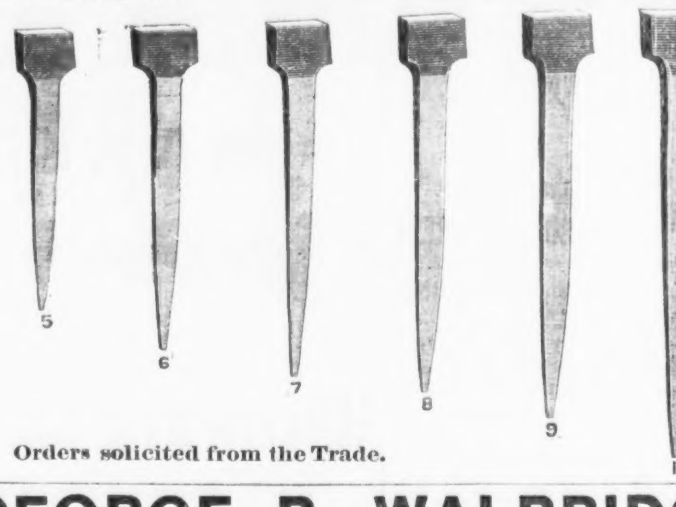
DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$15·50	$15·00	$14·00	$13·00
11 x 14 to 16 x 24	19·25	17·75	16·00	15·25
18 x 22 to 20 x 30	24·00	21·75	19·25	
15 x 36 to 24 x 30	28·00	24·50	20·00	
26 x 28 to 24 x 36	29·25	25·75	21·25	
26 x 36 to 26 x 44	32·00	29·00	23·25	
26 x 46 to 30 x 50	33·75	30·50	24·50	
30 x 52 to 30 x 54	36·00	32·50	26·00	
30 x 56 to 34 x 56	39·25	35·00	30·50	
34 x 58 to 34 x 60	41·75	39·25	34·25	
36 x 60 to 40 x 60	49·00	43·25	39·25	

Sizes above—$12·00 per box extra for every 5 inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 80 united inches, will be charged in the 84 united inches bracket.
Discounts 60&10 @ 60&15 %.

Hardware.

PRATT & CO.,
Hardware & Iron Merchants, Buffalo, N. Y.
Manufacturers of the Superior Brand,
BUFFALO FORGED HORSE NAILS.
These Nails are superior, being made with new and improved machinery and actually hammered from the best brands of **Norway Iron.**



Orders solicited from the Trade.

GEORGE B. WALBRIDGE,
99 Chambers Street, New York,
MANUFACTURER OF
ALWAYS COOL STOVE LID LIFTERS,

WITH VENTILATED HANDLE.
This Lifter is cast in one piece, with an open lattice-work handle, through which a current of air passes, thus constantly cooling the metal.
The Lifter is **light, handsomely finished** and very **salable.**

ALSO, REPRESENTS:

PRATT & CO., Nuts, Washers, Crow Bars, Horse Nails, &c.
SHELTON CO., Tacks, Carriage, Tire and Stove Bolts, &c.
SYRACUSE BOLT WORKS, Norway Iron, Philadelphia Carriage Bolts.
WOOLWORTH HANDLE W'KS, Axe, Pick, and Sledge Handles, &c.
CHALLENGE Augers & Bits, Union Bolts, & Spoke Shaves.
DERBY SILVER CO., Fine Plated Spoons, Forks and Ladles.
D. H. GOODELL, Lightning and Turn Table Apple Parers, &c.
ELEPHANT Edge Tools, Axes and Hatchets.
H. T. MILLER, Hatchets and Edge Tools.
SIDNEY SHEPARD & CO., French Stamped and Japanned Tinware.
NATIONAL HORSE NAIL CO., Polished and Finished Horse Nails.
SHOENBERGER & CO., Horse Shoes.

The Improved Champion Ice Cream Freezer of 1874,
Is in all respects **THE BEST IN THE MARKET.**
Patented, July 9, 1872.
TWELVE SIZES.

Geared.

No.	Quart.
20	3
21	4
22	6
23	8
24	10
25	12
26	16
27	20

Fly Wheel.

No.	Quart
28	16
29	20
30	40

Gang Freezers.
No. 31, two 20 quart together.
Please send for Circulars and Price Lists.

Sole Manufacturers, SIDNEY SHEPARD & CO., Buffalo, N. Y.
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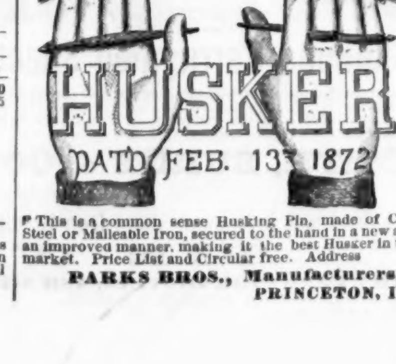
A. C. Downing & Comp'y,
Wm. C. Stuart. Francis Dougherty.
Importers of and Dealers in
Window Glass,
FRENCH PICTURE
And Car Glass, etc.
Estimates given by mail.
57 Beekman & 87 Ann Sts, NEW YORK.



☞ This is a common sense Husking Pin, made of Cast Steel or Malleable Iron, secured to the hand in a new and an improved manner, making it the best Husker in the market. Price List and Circular free. Address
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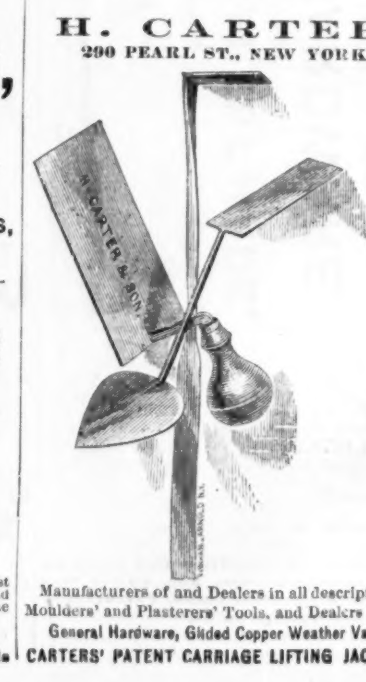
290 PEARL ST., NEW YORK.
Moulders' and Plasterers' Tools.



Manufacturers of and Dealers in all descriptions of Moulders' and Plasterers' Tools, and Dealers in
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CARTERS' PATENT CARRIAGE LIFTING JACK, &c

Grindstones, Emery, &c.

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Upon which to run the same, of all kinds.

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UNION STONE CO.,

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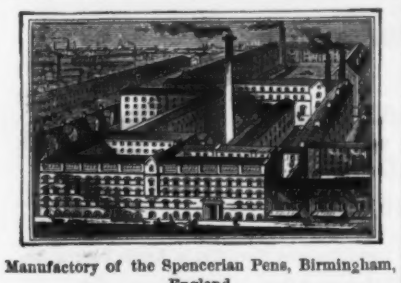
THE TANITE COMPANY

Emery Wheels — TANITE — Emery Grinders

STROUDSBURG, MONROE Co. Pa.



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SWAN QUILL Action!

SPENCERIAN

STEEL PENS.

These Pens are comprised in 15 numbers; of the NUMBER ONE PEN alone we sold more than

5,000,000

In 1873.

and the sale is continually increasing.

They are of superior English make, and are justly celebrated for their elasticity, durability, and evenness of point. *For Sale by the trade generally.*

☞ *To accommodate those who may wish to try these Pens, we will send a Sample Card, containing all of the 15 numbers, by mail on receipt of 25 cents.*

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SASH CHAIN.

Chain and Pulley for Heavy Sash.

THE BEST & CHEAPEST MADE.

BUILDERS' HARDWARE,

Manufacturers of every description of

Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,

Agents for Gauntlett's Black Lead Crucibles.

Agency and Depot of the TRENTON LOCK COMPANY.

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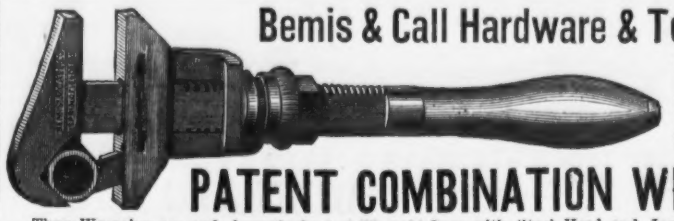
Established 1837.

Manufacturers of **Patent Brass Pad Locks for Railroads and Switches.** Also, **Patent Stationary R. R. Car Door Locks. Patent Plan and Sewing Machine Locks.**

141 to 145 Railroad Avenue, NEWARK N. J.

Illustrated Catalogues sent on application.

Bemis & Call Hardware & Tool Co.'s



This Wrench can be furnished with Brigg's Pat. Nut or Sleeve.

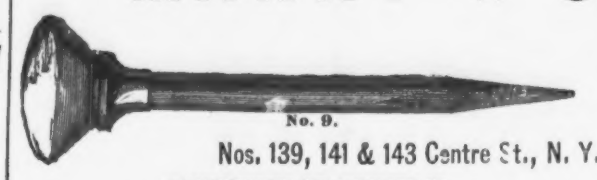
PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout. And not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench. Thus making a Combination which has no equal.

For Circulars and Price List, Address,

BEMIS & CALL HARDWARE & TOOL CO. Springfield Mass.

MARKT & CO.,

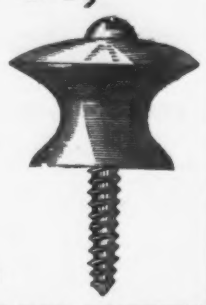


No. 9.

Nos. 139, 141 & 143 Centre St., N. Y.

MANUFACTURERS AND IMPORTERS OF

Hardware Specialties,



DOOR KNOBS (Lava, Wooden, Porcelain & Mineral), **SHUTTER, PICTURE AND DRAWER KNOBS,**

Plate and Drop Escutcheons, Picture Nails and Curtain Pins,

BRIGHT WIRE GOODS,

Alarm Whistles and Mouthpieces,

FURNITURE NAILS,

Bright Halter & Coil Chains, French Wire Nails,

Wrought Iron and Brass Butts.

Having consignment of one of the largest German manufacturers of **Halter and Coil Chains,** we can offer inducements on these goods.

We shall be pleased to send our new lists and prices to those who will apply.

L. COES & CO.,

Manufacturers of

L. COES'

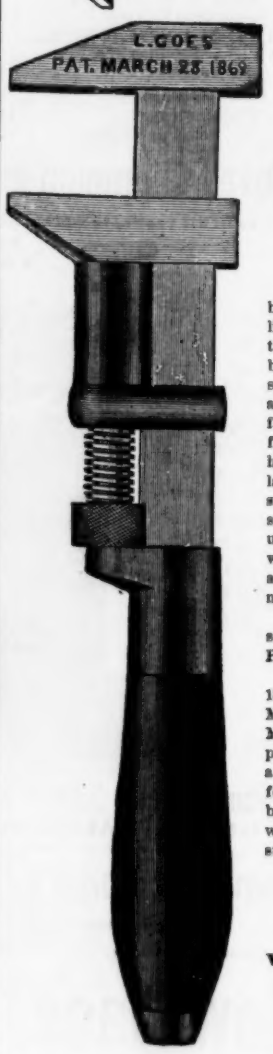
Genuine Improved

PATENT

SCREW

WRENCHES,

Worcester, Mass.



Our Mr. L. Coes, formerly senior member of the firm of L. & A. G. Coes, established in 1839, is the Original Inventor of the Screw Wrench, and has, by making the bar *wider*, where th strain comes most severe, and screwing a nut up firmly against four *square* shoulders inside the ferrule, thereby *effectually* preventing the ferrule from being thrust back into the handle or getting loose, and making a larger screw than in the old wrench, fully succeeded in making a 12 inch wrench stronger than a 15 inch made in the usual manner. All sizes are made in this way, and are undoubtedly the strongest and best finished Screw Wrenches in the market.

There ar *Imitations* of our goods offered for sale, that, without question, infringe on our Patents.

We hold Patents bearing date Nov. 10th, 1863 (re-issued June 1st, 1869), June 26th 1866, March 23d. 1869 (re-issued April 12th, 1870, and May 14th, 1872), which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the jaw, as seen in the cut of wrench complete. None genuine unless stamped

"L. COES & CO."

Warehouse, 97 Chambers and 81 Reade Streets, New York.

HORACE DURRIE & CO., Agents.

Coal

Hods.

Stamped Corrugated Sheet Iron Bottom Riveted.

We manufacture six styles having our patent corrugated bottom, and all having the body bottom and hoop **riveted** together. Dealers before buying will find it to their advantage to get our prices, and also to beware of a **seamed** hod that is in the market, somewhat similar in shape to ours. Don't buy any but the **Corrugated Riveted Bottom Hod,** manufactured by

SMITH, BURNS & CO., 46 Cliff St., N. Y.

Also Manufacturers of

Galvanized and Japanned Sheet Iron Goods, and Plain, Stamped and Japanned

TIN WARE.

FRY PANS, FIRE SHOVELS, ASH SIFTERS, &c. Send for Catalogue.

White Lead, &c.

John T. Lewis & Bros.,

No. 231 South Front St.,

PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.

MANUFACTURERS OF

PURE WHITE LEAD, RED LEAD, Litharge, Orange Mineral, Linseed Oil AND PAINTERS' COLORS.

ATLANTIC WHITE LEAD CO. ROBERT COLGATE & WARRANTED PURE

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The Atlantic White Lead and Linseed Oil Company,

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White Lead (Atlantic), Red Lead Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York.

Established 1782.

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Offices, 31st. St. below Chestnut, PHILADELPHIA.

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TRADE MARK.

White Lead, Red Lead and Litharge.

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Manufacturers of the well known Brand of

WHITE LEAD.

JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

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LINSEED OIL AND FLOOR OIL CLOTHS.

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FORTY-SECOND YEAR.

WARRANTED

EDGE TOOLS.

Goods stamped "D. R, Barton & Co." are NOT made by me.

For GENUINE "D. R. Barton" Edge Tools, Planes, Axes, &c., be sure to address D. R. BARTON, and NOT D. R. Barton & Co.

Factory and Office, Mill Street, cor. of Furnace.

D. R. BARTON, Rochester. N. Y.

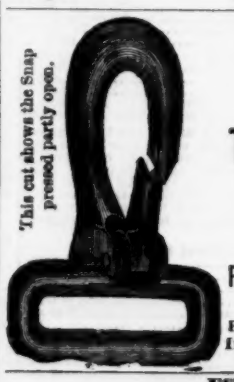
Iron & Brass Wood Screws.

Full assortment constantly on hand.

ALFRED FIELD & CO.,

Importers,

47 John, and 5 Dutch Streets, N. Y.



This cut shows the Snap pressed partly open.

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MIDDLETOWN, CONN.,

MANUFACTURERS OF

The Celebrated "Baldwin" Plane Iron

HENSHAW'S PATENT HARNESS SNAPS

GERMAN HARNESS SNAPS,

PAT. GAFF TOP-SAIL SELF-MOUSING SHIP HOOKS

Plow, Fillettster & Dado Stops of all kinds. Set Screws for Plows, Bench Plane Starts, &c. Patent Washer Cutters. Plane Iron Screws to order of any size.

Send for Illustrated Catalogue and Price List.

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Manufacturers of

LOCKS AND LATCHES.

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SPEAR & JACKSON,

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Saws, Files, Edge Tools and Steel.

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Hardware Commission Merchants,

IMPORTERS AND EXPORTERS.

Principal Offices and Warehouses:

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A large line of Birmingham and Sheffield goods in stock at

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Proprietors of **TRENTON VISE AND TOOL WORKS, Trenton, N. J.**—Vises, Picks, Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.
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Sole Agents for **LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.**—Table Cutlery and Butcher Knives.
W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.
Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S.
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We always have on hand a full assortment of

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Manufacturers of

Wrought Iron Butts, Strap and T Hinges,

PLATE AND HOOK HINGES,

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Wrought Butts, Strap and T Hinges.
Bronzed Butts and Bolts.
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Wrought Chest Handles, Washers, Flush Bolts, &c.

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THOMAS JOWITT & SONS,
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Celebrated FILES AND HORSE RASPS.
Rough and Ready and
CLIPPER SCYTHES,
Warranted.

"BEAVER"
(American,
FILES AND HORSE RASPS.
"WIDE AWAKE"
AXES.

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MANUFACTURERS, IMPORTERS AND DEALERS IN

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SOLE AGENTS FOR

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Manufacturers of Judds', Prindle's and Combination Patent Curtain Fixtures, Locks and Curtis Patent Pin Seeder, Patent Twine Boxes, Picture Nails and Hooks, Escutcheon Pins, Coat and Hat Hooks; also Miscellaneous Iron and Brass Goods.

Small Brass and Iron Castings made to order.

64 Duane Street, NEW YORK.

JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.

GRANTED A.D. 1766, BY THE CORPORATION OF CUTLERS OF SHEFFIELD, AND PROTECTED BY ACT OF PARLIAMENT.

THE TRADE MARK, IN ADDITION TO THE NAME, IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY

JOHN WILSON.

BUYERS ARE SPECIALLY CAUTIONED AGAINST IMITATIONS OF THE MARK, AND THE SUBSTITUTION OF COUNTERFEITS BEARING THE NAME, "WILSON," ONLY.

Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

BEAM & MURRAY,

IMPORTERS OF

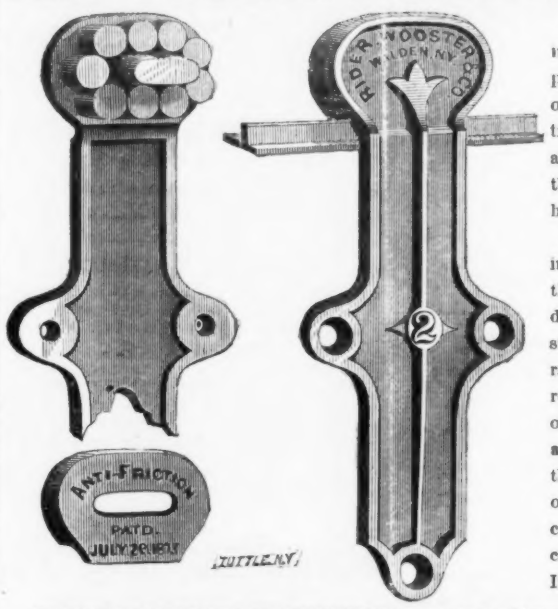
Anvils, Chains, Pocket Cutlery, Guns, Files,

BIRMINGHAM, SHEFFIELD & GERMAN HARDWARE,

Wostenholm's IXL Pocket Knives & Razors, Butcher's Files, Tools, &c.

No. 93 Chambers Street, NEW YORK.

Anti-Friction Barn Door Hanger



This Hanger is entirely new in principle and design, and possesses marked advantages over all others, entirely obviating all the defects and annoyances hitherto experienced in the use of ordinary sheaved hangers.

In construction it is exceedingly simple, as will be seen by the cut. The weight of the door is supported by a strong stud, between which and the rail is a series of chilled iron rollers, inclosed by the front of the hanger and cap, and as these rollers pass under the stud, they are returned over it in succession. There is consequently no friction, except that of rolling surfaces. Its leading advantages are:

GREAT DECREASE OF FRICTION, moving (as determined by direct experiment) with **one-fourth the power required by any other Hanger in the world.**
Great Strength. Unlimited Durability.
No Axles and Sheaves to grind and break.
All bearing surfaces harder than steel.
Thorough protection from the weather.
It will not clog with snow and ice.
It cannot run off the track.
It causes the door to run perfectly true.
It cannot get out of order.
It is compact, Simple and Beautiful in design.

This Hanger will fit any ordinary rail, but our rail is preferable, from the fact that it has a double flange at the bottom, so that the screws will not work out and allow it to rock or tip over.

No. 1 Hanger, corresponding to 4, 5 and 6 in. Sheaves or Rollers.....per pair, $1·25
No. 2 " 6 inch and upward..... " 1·50
One Dozen Pairs in each case.—dis 30 per cent.
RAIL, with Double Flange.....per foot, 7 cents.
200 *feet in each case.*—dis 30 per cent.

RIDER, WOOSTER & CO., Manu'rs,

Walden, Orange Co., New York.

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BOSTON, Macomber, Bigelow & Dowse.
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GREENFIELD TOOL CO.,

Sole Manufacturers of the Celebrated

"Diamond" PLANE IRONS,

Of **Uniform** temper and finish. Solid **Steel Caps** and **Warranted. PATENT FORGED OX SHOES.** The **only** Shoe made with **concavity** to fit hoof, and the best and **cheapest. BENCH AND MOULDING PLANES** of every description. Also, Plow and Match Bits, Moulding and Rabbet Irons, Plane Stops, Cuts, Starts, Plates, &c., &c. Drop Forgings to order. Address for Catalogue and Prices

GREENFIELD TOOL CO., Greenfield, Mass.

Warehouses: **New York, 37 Chambers St.; Boston, 22 Oliver St.** ☞ Reduced Prices for 1874.

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Corner 16th & Buttonwood Streets,

PHILADELPHIA.

JAMES MOORE,

(Successor to MATTHEWS & MOORE,)

Engineer, Machinist, Founder and Boilermaker,

CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE.

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

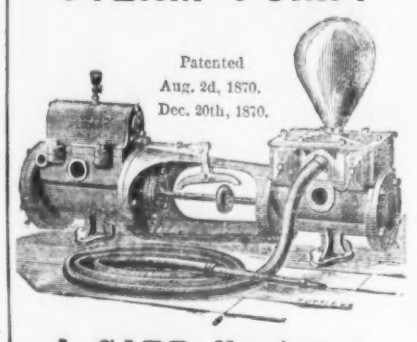
Sugar Mill, Saw Mill and Grist Mill Machinery,

AND MILLWRIGHTING IN GENERAL.

BOILERS—FLUE, TUBULAR AND CYLINDER, and all kinds of TANK AND PLATE IRON WORK.

The Selden Direct-Acting

STEAM PUMP.

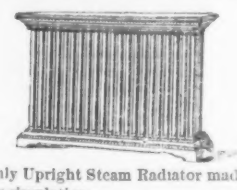


A. CARR, Manufacturer.

Combining simplicity and durability to a remarkable degree. Its parts are easy of access, and it is adapted to ALL PURPOSES for which Steam Pumps are used.

It is Unsurpassed as a Mining Pump

CARR'S POSITIVE
CIRCULATING
Steam Radiator.



The only Upright Steam Radiator made which has a *positive* circulation,

Selden Steam Pump, Wrought & Cas Iron Pipe, Brass Work, &c.,

for Plumbers, Steam and Gas Fitters.

For descriptive circular and price lists, address

A. CARR 43 Cortlandt St. N. Y.

DIRECT - ACTING

Steam Pumps,

Manufactured and for sale solely by

STEELE & CONDICT,

TITAN IRON WORKS, Jersey City, N. J.

Office and Salesroom,

88 Liberty Street, New York.

No auxiliary valves used. Direct connection between piston rod and valve movement. No knocking or jarring. Circulars and price lists sent upon application.

WILSON BOHANNAN,

Manufacturer of Patent

Brass Spring

PAD LOCKS

FOR RAILROAD SWITCHES,

Freight Cars, &c.

Cor. Broadway and Kossuth Street, BROOKLYN, E. D., N. Y.

Clement & Hawkes Mfg. Co.,

Manufacturers of

SHOVELS,

Planters' Hoes, Trowels and Machinery.

Northampton, Mass.

☞ Send for Circular and Price List.

Patent Automatic Muzzle.

[From the *New York Times*, June 22.]

"Mr. Bergh has a muzzle that he recommends, as it does not FRET or WORRY the dog when on his head. By a spring the dog can open his mouth to the fullest extent, and running out his tongue, pant with as much comfort as though he was not muzzled, and drink without any difficulty, but it is impossible for him to bite." The most humane invention of the age.

Manufactured by

W. T. & J. MERSEREAU, 32 Duane St., N. Y.

Sold by all Hardware Dealers.

SEND TO THE

ENTERPRISE MFG. CO.

FOR ILLUS. CATALOGUE.

AMERICAN COFFEE DRUG AND SPICE MILLS

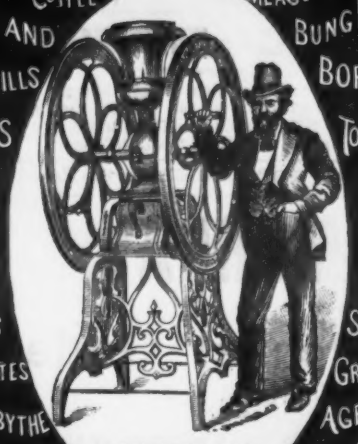
20 SIZES

MEASURING FAUCETS BUNG HOLE BORERS

TOBACCO CUTTERS

FOR SALE BY THE HARDWARE TRADE

CHEESE KNIVES MOLASES GATES MADE BY THE ENTERPRISE MFG CO



20 DIFFERENT SIZES OF MILLS.

SAW SETS &c&c. GRAHAM & HEINES AGENTS 88 CHAMBERS ST N.Y.

PHILADELPHIA.

THE CELEBRATED

YALE LOCKS

FOR ALL USES.

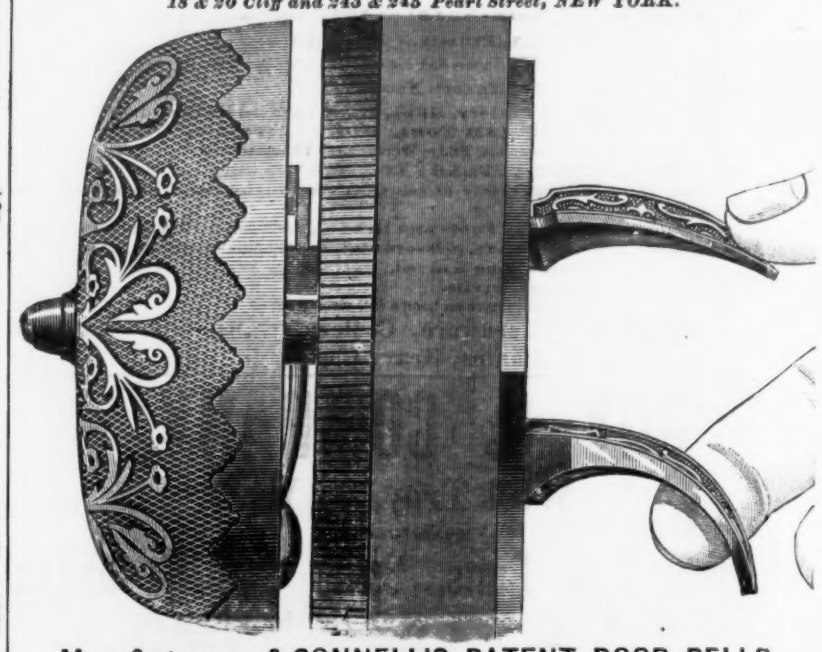
ORNAMENTAL REAL BRONZE HARDWARE.

Yale Lock Manufacturing Co., Stamford, Conn.

Salesroom, No. 298 Broadway, NEW YORK.

The Hart, Bliven & Mead Mfg. Co.,

18 & 20 Cliff and 243 & 245 Pearl Street, NEW YORK.



Manufacturers of CONNELL'S PATENT DOOR BELLS.

For Prices and Description, see *The Iron Age*, April 2d, page 24.

WHEELING HINGE CO.,

Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks, Hasps & Staples, Wrought Repair Sinks & Washers,

GRAHAM & HAINES, Sole Agents, 88 Chambers Street, N. Y.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Glass Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order &c

NEW YORK AGENCY

Grundy & Kenworthy HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts

AMERICAN BUTT CO.,

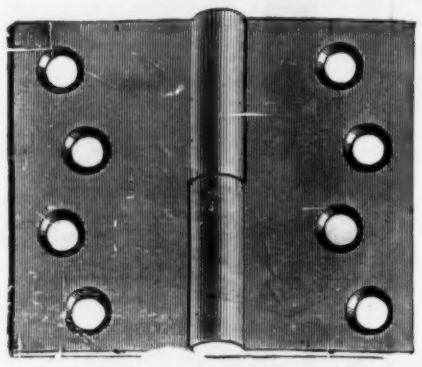
PROVIDENCE, R. I., Manufacturers of

Cast Butt Hinges,

AND

BUILDERS'

HARDWARE.



New York Warehouse with

Messrs. GRAHAM & HAINES,

No. 88 Chambers Street.

Send for Price List.

Al kinds of

SMALL CASTINGS

Made to order.

SAMUEL LORING'S

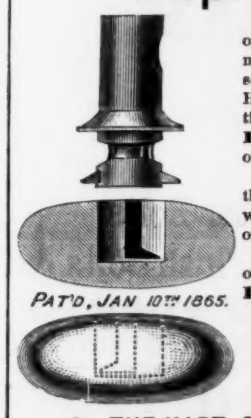
PLYMOUTH TACK AND RIVET WORKS

PLYMOUTH, MASS., manufacturer of

TACKS, BRADS, NAILS AND RIVETS.

Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian, 2d, 3d and 3d Fine, Trunk, Clout, and Cigar Box Nails; Blued and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points &c., &c., &c., COPPER, BRASS AND IRON RIVETS, of all kinds. Coopers' Rivets, from 1d to 6d, in casks of 100 lbs. each. Hose, Belt and Shoe Rivets and Burs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS

Improved Door Knobs.



On the 10th January, 1865, we obtained Letters Patent for improved method of securing necks to Mineral and Porcelain Door Knobs, which improvement was used by us long enough to prove its utility, but on account of unsettled claim of joint ownership by former partner, its use was discontinued. Having now made a further improvement, for which we have made application for a Patent, we are now making the **BEST SECURED** and **MOST DURABLE** Mineral and Porcelain Door Knobs ever offered in this or other markets.

We solicit orders for these Knobs at our regular prices for old styles, with the understanding that if any can be loosened from or gotten off the necks without breaking the tops, they may be held by the purchaser subject to our order, with expenses added.

See *The Iron Age*, of August 21st., page 11, for illustrated description of our patent **Telescope Locks and Latches,** with patent Flat **Steel Perforated Keys,**

Address

BRANFORD LOCK WORKS,

Branford, Conn.

Or, THE HART, BLIVEN & MEAD MANUFACTURING CO., Agents,

18 & 20 Cliff and 243 & 245 Pearl Streets, New York

Headquarters for

Henry Disston & Sons' Saws,

Hand, Mill, Circular and Cross Cut.

ALSO,

Plumbs and Levels, Try Squares, Gauges, Trowels and Barker's Reversible Butt.

A full assortment constantly on hand. Address orders to

GRAHAM & HAINES, 88 Chambers Street, N. Y.

Schweitzer Mfg. Co.,

57 Reade Street New York.

CONTINENTAL LOCKS,

Made of Wrought Iron or Brass, very superior quality, and only an auger used in mortising.

SCHWEITZER PAD LOCKS,
EXCELSIOR COMPASSES.
EXCELSIOR DIVIDERS,

WITH

STUBS' STEEL POINTS,

Best and Cheapest Goods in the market. Sole Agents for the United States for

NEWBOULD'S FILES AND TOOLS

French Coffee Mills.

NOBLE MFG. CO., Tools, Ship Augers, &c.

Emery, Waterhouse & Co., Shovels & Spades

We also make a superior

AXE. { *"Queen of the Forest,"* / *"Wood Chopper's Pride,"* &c

Disston's Saws. (Largest stock in the City).

General dealers in

FOREIGN & DOMESTIC HARDWARE.

CENTENNIAL

SELF-LUBRICATIVE

Hemp Piston Packing

FOR

Locomotives, Steamships, Stationary Engines, Hot or Cold Water Pumps.

Recommended by Master Mechanics and Engineers, as the cheapest and best in market. **No more Extortionate Prices. No more Fluted Rods**—but a good article at fair price.

JOHN CANFIELD & CO.,

SOLE MANUFACTURERS,

Office, 1321 Fairmount Ave., Phila.

PATENT APPLIED FOR. Send for Circular.

SOLE AGENTS IN NEW YORK.

MOWRY, MASTERS & ANDREWS,

AM. TEA TRAY WORKS,

GREENWICH, N. Y.

TIFFT & HOWARD, 12 MURRAY ST.

SOLE AGENTS IN NEW YORK.

J. F. GREEN & BRO.

Manufacturers of Family Grindstones,

HAVERSTRAW, N. Y.

TIFFT & HOWARD, 12 MURRAY ST.

Easily Applied and not Liable to get out of Order."—From Report of Judges at American Institute Fair, 1872.

The Challenge Door Spring Co.,

Patented. [March, 1873

Exclusive Manufacturers of the

In Appearance the Most Beautiful. In Action the Most Graceful. In Use the Most Reliable.

The Challenge Springs are manufactured from **Steel Wire, tempered by an Improved Process,** the result of repeated experiments, and must not be classed by dealers with the numerous worthless "Coil Springs" made from common Bed Spring Wire.

No. 49 Ann Street, NEW YORK.

BAEDER, ADAMSON & CO.,

Manufacturers of

Sand and Emery Paper and Emery Cloth

(Also, in Rolls for machine work.)

GROUND EMERY, CORUNDUM AND FLINT,

Glue & Curled Hair, Cow Hide Whips.

STORES:

PHILADELPHIA, 720 Market St., | BOSTON, 143 Milk St.,
NEW YORK 67 Beekman St., | CINCINNATI, 92 Main St.,
CHICAGO, 152 Lake St.

TIFFT & HOWARD,

MANUFACTURERS OF

GAS AND KEROSENE STOVES,

AND PATENTED SPECIALTIES IN

HOUSEKEEPING GOODS,

12 Murray Street.

Acknowledged the Best.

"Champion."

Equal pressure on the Rolls.

Clear Table, Self Regulating & Elastic.

Durable.

"Champion."

Makes a straight Flute.

Never Cuts the Material.

Don't get out of Order.

CHAS. FELDER, 105 Reade St., N. Y.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.—Solid Cast Steel....₩ ℔ 14c
Peter Wright's....₩ ℔, gold, 12½c
Wilkinson's....11½c
Eagle....11 cents currency—dis 15 @ 15&5 %
Apple Parers.—Union....per doz $6 50 net
Skeleton.... " 6 50 net
Victor.... " 6 75 net
Domestic.... " 7 00 net
Reading.... " 7 00 net
Bay State Paring, Coring and Slicing.... " 12 00 net
" " Peach Parers.... " 10 50 net
Axes.—Mann's Light....Per doz. $13 00 @ 12 50
Hunt's Light.... " 13 00 @ 12 50
Red Indian, all sizes.... " 12 50 @ 12 00
Red Chieftain, all sizes.... " 13 00 @ 12 50
Crown Prince.... " 13 50 @ 13 00
Augers and Auger Bits.—Pierce's Pat. *
Twist Bits....dis 25 @ 30 %
Douglass' & Ives' Bits....dis 30&10 %
Connecticut Valley Auger Bits....dis 35&10 %
Cook s Bits....dis 40&10 %
Jennings' Bits....dis 10 %
Bates' Nut Augers....dis 30&5 %
Douglass' & Ives' Augers....dis 30&10 %
Watrous' Ship Augers....dis 10 %
Bonney s Pat. Hollow Augers....dis 25 %
Stearn's Patent Hollow Augers....dis 25 %
Balances.—Landers Frary & Clark's....dis 15 %
Chattillon's....dis 15 %
Morton's....dis 15 %
Common Spring with Hook....₩ doz $1 38 @ 2 00
Bells.—Bevin Bros. Mfg Co. Light Hand Bells....dis 60&10 %
Other makers light....dis 65&10 %
Swiss Pattern Hand Bells....dis 50 %
Connell's Door Bells....dis 50 %
Great Western and Kentucky Cow....dis 50&10 %
Boring Machines.—Bates' Mfg. Co., complete with augers....dis 15 @ 20 %
Douglass' Mfg. Co., complete with augers..dis 15 @ 20 %
Common Boring Machines, no Augers....$4 25 @ 4 00
Anguar " " .... 5 25 @ 5 00
Bolts.—Eastern Carriage Bolts....special prices
Western " " "
Philadelphia " " ....dis 50 @ 50&5 %
Wrought Snutter Bolts....dis 50 %
Cast " ....dis 50 %
Skelly's Phila. Norway iron, finish. points....dis 50 %
Braces.—Barber s....dis 40&5 %
Backus....dis 45 @ 50 %
Bartholomew s American Ball....dis 10&10 %
Spofford....dis 40 @ 40&5 %
Butts.—Cast Fast Joint, Narrow....dis 40 @ 40&5 %
" " Broad....dis 50 @ 50&5 %
Cast Fast Loose Joint....dis 50 @ 50&5 %
" Acorn, Loose Pin....dis 40&10 %
Wrought Loose Pin....dis 35 %
" Table Hinges and Back Flaps....dis 30 %
" Narrow....dis 30 %
" Loose Joint....dis 35 %
" Reversible....dis 35 %
Parker's Blind Butts, Shepard's " " , Clark's " " , Cherrytree " " for wood. } dis 50 %—dis by the case 50&5 %
Lull & Porter's....dis 40 %
Clark's Mortise Butts....dis 40 %
Chains.—German Halter....dis 15 @ 20 %
" Coil....dis 15 @ 20 %
Galvanized Pump....₩ ℔ 15c
Best Proof Coil Chain—

₩ ℔...	13⅝	10¾	10	9¼	9¼	9	8¾c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 500 lbs., discount ½c per lb. Common Chain, ¾c per lb. less than proof.
Chisels.—Socket Framing....dis 60 @ 60&10 %
Socket Firmer....dis 60 @ 60&10 %
" Tang....dis 40 @ 40&10 %
Beatty's Framing and Firmer....dis 10 @ 15 %
Casters.—Porcelain Wheel....dis 40&10 %
Iron and Brass Wheels....dis 40 %
Iron Bed....dis 40 %
Clothes Wringers.—Universal....per doz $60 00
Novelty. " 60 00
Providence. " 60 00
Monitor. " 60 00
Orders for 5 dozen lots, discount $3 per dozen.
Coffee Mills.—Common Box and Side....dis 10 @ 15 %
Patent Box and Side....dis 10 @ 15 %
Cutlery.—American Pocket (best)....dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Hart Mfg. Co. s ..dis 60 @ 60&10 %
Concave Adjustable Handle....dis 10 %
Beatty....dis 10 @ 15 %
Fry Pans.
Tinned....dis 20 %

₩ doz..	$3 00	3 25	3 62	4 00	4 50	5 00	5 50	6 00	7 50
No....	0	1	2	3	4	5	6	7	8

Burnished.

₩ doz..	$2 80	3 00	3 38	3 75	4 12	4 50	5 00	5 62	6 75
No....	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files...new list, $5 00 to £ cur dis 12½ %
" Bastard.... " 5 00 to £ cur dis 12½ %
" Taper.... " 5 00 to £ cur dis 12½ %
Butcher's Mill....$5 50 to £ gold
" Bastard....5 50 to £ gold
" Taper....5 50 to £ gold
Fluting Machines.
K. F. M.—4½ in. rolls, $5 50....dis 10 %
—6 in. rolls, $6 65....dis 10 %
Mrs Knox—4 in. rolls, $5 50....dis 10 %
" —6 in. rolls, 6 65....dis 10 %
Hammers.
Yerkes & Plumb's....dis 12½ %
Hammond & Son's....dis 12½ %
Verce....dis 12½ %
Hatchets.
Beatty's....dis 10 @ 15 %

Shingling and Half.	₩ doz..	$7 00	7 50	7 75	8 00
	No.....	1	2	3	

Yerkes & Plumb....dis 15 %

Shingling and Half.	₩ doz..	$7 00	7 50	8 00	8 50
	No.....	1	2	3	4

Claw.... ₩ doz. $7 50 8 00
No. 1 2 3
Hinges.—Strap and T....dis 25&10 %
Bonney's Gate No. 0....dis 15 %
" " 1....dis 25 %
" " 2 and 3....dis 35 %
Horse Nails.

	Nos.	5	6	7	8	9	10
Ausable....		27	25	24	23	22	
Globe....		28	26	25	24	23	
Brundage....		26	24	23	22	21	
	Nos.	5	6	7	8	9	10
Putnam....		32	28	26	25	24	22

On Ausable, Globe and Brundage 1000 ℔ lots....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination....new list dis 45 %
Extra discount for cash 2 %
Mineral and Rim....dis 5 %
Locks and Latches.—Rim and Mortise....dis 45 %
Extra discount for cash 2 %
Till and Cupboard....dis 25 %
American Padlocks....dis 50 %
Scandinavian Pad Locks.

₩ doz.....	$10 50	10 50	12 00	12 00	15 00	15 00	dis 15 %
No.....	9	9¾	10	10¾	11	11¾	
₩ doz.....	$18 00		18 00		22 00	22 00	dis 15 %
No.....	12		13½		18	18¾	

Trunk Locks....dis 5 @ 10 %
Thumb and Roggens Latches....dis 25 %
Lanterns.—Square Candle and Oil....dis 10 %
Globe for Oil....dis 10 %
" Kerosene....dis 10 %
Tubular Lanterns....dis 10 %
Mattocks.—Long and Short Cutter....dis 25 %
Western Pattern....dis 25 %
Pennsylvania Pattern....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets....dis 20 %
Stebbins' Gates....dis 60 @ 60&10 %
Lincoln's " ....dis 40 @ 40&10 %
Landers, Frary & Clark's Petroleum....dis 10 @ 10&10 %
Taylor's Petroleum Faucets....dis 20 @ 20&10 %
Brass Liquor Cocks....dis 20&10 %
Meat Cutters.—Dixon's....dis 10 %
Woodruff....dis 10 %
Stowe....dis 10 %
Hale's....dis 25 %
Stuffers....dis 10 %
Planes.—Auburn Tool Co., "Bench ".. dis 35 @ 25&5 %
Second Quality....dis 50 %
Metallic Plane Co....dis 25&5 %
Evans Pat. Circular....net
Plane Irons.—American....list net
Butcher's....gold £, $5 50
Picks.—Philadelphia....net
Pittsburgh....net
Plumbs and Levels.
Stanley Rule and Level Co....dis 60&10 %
Wm. Johnson, (Stanley List)....dis 60&10 %
Rakes.—Cast Steel Garden....dis 55½ %
Malleable Garden....dis 33½ %
Wood Head Iron Teeth....dis 30 @ 40 %
Rules.—Stanley Rule and Level Co....dis 60 @ 60&10 %
Steven's and Hubbard's....dis 60 @ 60&10 %
Steelyards.—American Pattern....dis 15 %

₩ doz.....	$5 50	7 00	9 00	10 00	11 00	12 00
No.....	50	100	150	200	250	300

English Pattern....dis 15 %

₩ doz.....	$7 00	8 67	10 67	12 67	14 67	16 67
No.....	50	100	150	200	250	300

L. F. & C. Excelsior....dis 10 %

₩ doz.....	$9 00	10 00	12 00	15 00	18 00	21 00
No.....	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened....₩ doz. $11 00 net
Clipper No. 10, Boxed and Sharpened....₩ doz $10 80
" " 5, " " " 10 00
Common Scythes....₩ doz $7 00 @ 10 00
Squares.—Steel and Iron, new list....dis 50 %
Saws.—Disston's Cross Cut....dis 12½ %
Disston's Hand....dis 12½ %
W. McNiece's Hd. Cross-Cut & Circ'r, new list..dis 12½ %
Boynton's Lightning, new list....dis 30 %
Shovels and Spades.
Rowland's Plain Rack, list Sept. 1st....dis 30 %
" Back Strap " " ....dis 30 %
Oliver Ames & Sons....new list dis 12½ %
Brady Shovel Co....dis 12½&2½ %
Sad Irons.—Richmond (polished face), per lb. 4¼c. net
Coquanock (polished face)....per lb. 4 c. net
Stone.—Arkansas Oil, No. 1....₩ ℔ $1 75
Turkey Oil, No. 1.... " 1 00
Washita Extra.... " 30c
" No. 1.... " 22c
" " 2.... " 18c
.... " 5½c

Screws.—Iron....new list, Jan. 1st, 1874, dis 52½ %
Brass....dis 57½ %
Spoons.—
Plated....dis 40&5 %
Britannia....dis 40&10 %
German Silver....dis 20 %
" Light....new list dis 15&5 %
Lalance & Grosjean Iron....dis 10 %
Springs.—Gray's Door....dis 40 %
Torry's Door....dis 40 %
Stocks and Dies....dis 15 %
Stove Polish.—Gem....₩ gross, $5 00
Onyx.... " $5 00
Try Squares.—Winterbottom....dis 10 @ 15 %
Stanley Rule and Level Co....dis 45&10 %
Willis Thrall, No. 2....dis 30&10 %
Disston's No. 2....dis 40 %
Tacks, &c.—Half Weight Tacks....dis 72½ %
" " by the case....dis 72½&7½ %
Clout and Finishing Nails....7½ %
" " by the case....dis 7½ %
Traps.—Genuine Oneida—Newhouse list....dis 20 %
Imitation " " " ....dis 30 %
Vises.—Solid Box....₩ ℔ net 15c
Wrenches.—Coes Genuine....dis 40 %
Coes Imitation Wrought Bar....dis 50 %
" " Malleable Bar....dis 60 %
" " (Kellogg) Malleable Bar....dis 50 @ 10 %
Tafts Pattern (Wrought Bar)....65 %
" " Kellogg's (Nail Bar)....dis 65&10 %
Philadelphia Tool Co.'s Pat. Duplex....dis 25 %
" " " Improved Baxter....dis 25 %
" " " Adjustable Fork....dis 25 %
Wire.—No. 0 to 18....dis 40 %
No. 19 to 26....dis 45 %
No. 27 to 36....dis 45 @ 47½ %
Coppered 0 to 12....dis 15 @ 20 %
Tinned Broom Wire....dis 20 %
Galvanized Wire No. 0 to 15....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

July 25, 1874.

Augers—Snell Mfg. Co....dis 20 %
Bits, Auger—Snell Mfg. Co....dis 20 %
Bells, Cow—Yaw s Genuine....dis 25 %
Bolts—Carriage and Tire....dis 20&20 %
Braces—Bit, Spofford's Patent....dis 40 %
Brads, Cut....dis 50&7½ %
Boards—Stove, Brooks' Patent....dis 30 %
Butts—Brass....dis 25 %
Cast Loose Joint....dis 60 %
" " Pin....dis 45 %
" " " Japanned....dis 45 %
" " " Silver Tipped....dis 25 %
Wrought Narrow....dis 30 %
" Broad, Loose Joint....dis 35 %
" Table and Back Flaps....dis 30 %
Wrought Butts, Loose Pin....dis 35 %
Belting—Rubber....dis 30 @ 35 %
Leather new list....dis 30 @ 30&5 %
Beaters, Egg, "Peerless"....per doz $4 00
Brick—Bath (box of 2 doz) Best English....$1 50
" Rutherford "....$1 00
Chalk—White, Carpenter s ....₩ gross, 50c
Red, Carpenter's .... " 75c
Blue, " .... " 90c
Chisels—Firmer Socket....dis 60&10 %
Framing Socket....dis 60&10 %
Corner Socket Chisels....dis 60&10 %
Slick's Carpenters'....dis 60&10 %
Castings—Malleable ....₩ ℔ 10½c
Cherry Seeders....per doz $12 00
Clothes Wringers, "Novelty " No. 2....₩ doz $62 00
Elbows—Corrugated.....

	5	5½	6	7	dis 10 %
Charcoal....	$3 50	4 50	5 25	6 50	
Russia....	7 00	9 50	12 00	14 00	

Files—Maischoss Bros....dis 50 %
Freezers Ice Cream—"Champion ....dis 33½ %
Hammers—Henry W. Kip's....dis 7½ %
Hinges—Window Blind—
Clark's....dis 50&5 %
Shepard's and Standard....dis 50&5 %
Wrought Strap and T....dis 20&10 %
Hods, Coal—Plain, Black and Galvanized....dis 10 %
Funnel, Black and Galvanized....dis 10 %
Fancy and Helmet....dis 10 %
Palace Coal Vases....dis 10 %
Hooks and Staples—Wrought....dis 60&10 %
Hooks—Belt....dis 50 %
Hasps and Staples—Wrought....dis 60&10 %
Sad Irons....4c
Kettles—Brass....₩ ℔ .50 @ 55c
Enameled....dis 50 %
Knives, Drawing—Oval No. 1....dis 60&10 %
Razor Blade....dis 50&10 %
Lanterns "Peerless,".....No. 4 5 10

	₩ doz	$26 00	$11 25	$13 75	dis 10 %

Gem, with guards....$6 50
Tubular....11 00
" with Guards....11 50
Machines—Apple Paring, "Turn Table"....$50 ₩ doz
Mills, Coffee—Box and Slide, common....dis 10 %
Box Union and Eagle....dis 10 %
" American....dis 20 %
Nails—Clout and Finishing....dis 7½ %
Shoe....dis 7½ %
Horse, Ausable.....No. 5 7 8 9 10

	30	27	25	24	23	22c

" " Finished & Pointed....add 1c ₩ ℔
" " 1000 lbs....dis 5 %
" Clinton.....No. 6 7 8 9 10

	22	20	19	18	17c

Packing—Rubber....dis 30 @ 35 %
Pencils, Slate—Soapstone....4 5 6in.

	30	40	50c. ₩ 100

Case lots....dis 20 %
Paint—White Lead, U. S. Gov't....₩ ℔ 9 c
Rivets—Iron, Black and Tinned....dis 25 %
Copper....dis 10 %
Rope—Manila, ½ inch and larger....₩ ℔ 15½c
Rules—Boxwood and Ivory, Stephens....dis 60 %
Screws—"American Screw Co"—
Flat Head, Iron....dis 52½ %
Flat Head, Brass....dis 53½ %
Staples—Blind, Boardman s Pat., ½ & ⅝....₩ ℔ 31c
Spoons, Iron Tinned....dis 10 %
" by the case....dis 20 %
Plated Rogers' A No. 1....dis 40 %
Britannia....dis 40 %
Squares—Steel and Iron....new list 50 %
Shoes, Horse—H. Burden & Sons....₩ keg $6 00
Shovels & Spades—Shepard, Forsyth & Dennison..dis 20 %
Saws—Henry Disston & Sons....dis 10 %
Scales—Buffalo Scale Works....dis 25 %
Fairbanks....dis 15 %
Shears—Seymour's....dis 60 %
Traps, Steel—Newhouse....dis 20 %
Tacks—Half Weight Am. Iron....dis 72½&7½ %
Vises—Parallel, Buffalo....dis 20 %
Wrenches—Coes' genuine....dis 40 %
Coes' Imitation....dis 50&10 %
Tafts' Pattern....dis 65&10 %
Ware—French, Tinned and Iron....dis 25 %
Stamped and Japanned....dis 10 %
Cast Iron Hollow....dis 33½ %
Tin Plates.—Add for each X....$0 75
10x14, IC, Charcoal....$12 00 | 14x20 C, terne....$10 75
12x12, " .... 12 50 | 20x28 C, " 21 75
12½x17, " .... 11 50 | 20x28 X, " 27 25
14x20, " 13 00
Pig Tin—Straits....30c @ 31c
Bar Tin....32c
Solder....No. 1, 17c; No. 2, 16c
Sheet Zinc—
"Lasalle"....570 ℔ casks $10 00 | 100 ℔ 10 30 ₩ 100 ℔s
Sheets....$10 00
Iron Wire—Bright and Annealed....dis 37½ %
Coppered....dis 32½ %
Tinned....dis 15 %
Tinned Broom, { Nos. 20 | 21 | 22 } ....dis 20 %
20c | 21c | 21c
Copper—Sheathing 14 @ 18 oz....₩ ℔ 33c
Planished....₩ ℔ 39 @ 41c
Bottoms....₩ ℔ 34c
Bolts....₩ ℔ 35c
Braziers' Sheets....₩ ℔ 35c
Sheet Iron.—
18 Common....$5 00
24 Common....5 00
24 W. D. Wood & Co., Smooth Finish....6 10
Am. Russia....A. B.
15c 12½c
Gen. Russia, No. 1 stained....13c
" " clean....30c
Galvanized....dis 15 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal....$ @ 12 00
I. X. 10x14 Charcoal.... @ 17 00
I. C. Terne 14x20.... 11 00 @ 12 00
I. C. Terne 20x28.... 24 00 @ 25 00
I. C. Continuous.... 24 00
Block Tin....₩ ℔ 30c @ 31c
Solder.—
S. & Co....₩ ℔ 26c
Lead.—Pig....₩ ℔ 7c.
Copper.—
Ingot....₩ ℔ @ 36c
Planished.... " @ 44c
Sheathing.... " @ 35c
Copper Drops @ 36c
Zinc. Cast, 500 to 1000 lbs....₩ ℔ 10 c
Case, 100 lbs.... " 11 c
Slab.... " 7½c
Brass.—
Roll, No. 6 to 20....₩ ℔ 35c
" 30 to 38.... " 40c
Babbit Metal.—
Sellew & Co....₩ ℔ 30c
Antimony....₩ ℔ 17c
Bismuth....₩ ℔ $4 00
Nickel....₩ ℔ $4 50
A. Russia A....₩ ℔ 13c
" B.... " 12½c
Smooth Smooth
Com. B. Fin. S. L. U. D Re'fd.
15 to 20.... 4½c 5½c 7½c
22 to 24.... 4½c 6½c 8½c
26.... 4½c 6¾c 8¾c
27.... 5 0c 6¾c 8¾c
Galvanized Iron.—Full bundles....dis 20 %
Nos. 18 to 20....12c | No. 26....14c
22 to 24....13c | 27....15c
Bar Steel.—Silver, ₩ ℔ 16c; Crescent, 21c.
Iron Wire....dis 33 %
Enameled Ware....dis 45 %
One Piece Corrugated Elbows.....dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch.....	₩ doz $2 50	4½ inch.....	₩ doz $5 00
5 "	" 3 50	5 "	" 7 00
5½ "	" 4 50	5½ "	" 9 50
6 "	" 5 25	6 "	" 12 00
7 "	" 6 50	7 "	" 14 00

Leader Elbows, Flat Crimp Retinued or Galvanized.—Dis. 10 %

	₩ doz.		₩ doz.
2-inch....	$1 75	2½-inch....	$2 75
3-inch....	2 25	3½-inch....	3 25
4-inch....	2 50	4½-inch....	3 50

Sheet Iron Brand Pans....₩ ℔ 10c
American Broilers....₩ doz. $12 00
Tinmen's Machines....dis 5 %
Sad Irons....₩ ℔ 4 c
Brass Kettles.—Ansonia....53c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent.
Iron, standard list assorted sizes, for large orders, &c, card rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4½c ₩ ℔ net
Iron Wedges....4½c ₩ ℔ net
Norway Nail Rods....9¼c ₩ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point)....5c ₩ ℔ net
Beetle Rings....8¾c ₩ ℔ net
Fence Pickets—
¾ round, bent to shape, 30c ₩ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts (new list)....70&10 % off net
Plow Bolts....30, 10&5 % off net
Stove Bolts....15 % off net
Machine and Square Head Bolts....30&10 % off net
Coach and Lag Screws....30&10 % off net
Bolt Ends....35 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅜ in....7½c ₩ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in....6 c ₩ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅜ in....9 c ₩ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in....7 c ₩ ℔ off net
Nuts and Washers in 25 lb. boxes, 1c ₩ ℔ ex. Nuts and Washers in lots less than one keg each size, 1c ₩ ℔ ex. Nuts and Washers in 5 lb. boxes, 1½c. ₩ ℔ ex.
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3¾c ₩ ℔ net; ⅞, ¾ in. diam. 3¾c ₩ ℔ net; ⅝ in. diam. 4c ₩ ℔ net.
Patent Headed Harrow Teeth, packed in casks, ¾c ₩ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5¼c ₩ ℔ net; 9-16 in. diam. 6½c ₩ ℔ net; ½ in. diam. 7½c ₩ ℔ net. 1c ₩ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ¾ to 1 in. diam. 9c ₩ ℔ net; ⅝ in. diam. 10c ₩ ℔ net; ½ in. diam. 12 c ₩ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 to 36 in. long, 5½c ₩ ℔ net; 8, 10 & 12 in. long, 6¾c ₩ ℔ net
Strap and T Hinges....20 & 10 % off net, delivery as customary.
For purchases amounting to $250 between May 20th and December 31st, 5 % extra off.
Screw Hitching Rings....$5 25 ₩ 100 net
Duck Nest Tuyere Irons....$14 50 ₩ doz net
Cast Iron Washers....₩ ℔ 4c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long....₩ ℔ 4 c net
1 to 2 in. diam. from 4 to 8 ft. long.... " 4¼c net
1 to 2 in. diam. from 1½ to 4 ft. long.... " 4½c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long.... " 4¾c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 5¼c net
Bridge bolts with upset ends....¼c. ₩ ℔ extra
Wrought iron plates, punched....5c. ₩ ℔ net

WAGON HARDWARE.

Wagon Box Strap Bolts—

10 in. long by 7-16 at Screw End, ₩ set of 8 bolts..							55c
12 "	½	"	"	8	"	..	70c
10 "	9-16	"	"	8	"	..	90c
12 "	9-16	"	"	8	"	..	
14 "	9-16	"	"	8	"	..	$1 00
10 "	⅝	"	"	8	"	..	1 00
12 "	⅝	"	"	8	"	..	
14 "	⅝	"	"	8	"	..	1 10
16 "	⅝	"	"	8	"	..	1 20

5c ₩ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each....18c
" " wide track, each....20c
Single Tree Irons, ₩ set of four pieces....38c
Wrought Iron Bolster Plates, 2¼ in. wide, ₩ set....60c
" " " 3 " " " 65c
" " " 3¼ " " " 70c
" " " 3½ " " " 75c
Wagon Brake Ratchets, each....16½c
" " " finished with guard, each..45 c
Wrought Hammer Straps, heavy pattern, each....16 c
" " " light " each....13½c
" Rub Irons, each....11 c
Stay Chain Hooks, each....8 c
Double and Single Tree Clips, figure 1, each....9 c
" " " 2, each....10 c
" " " 3, each....12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 sets....dis 25 %
Wagon Box Staples, 1¼ to 2¼ in. to clinch, ₩ 1000 $11 00 net
" " " Bevel Box Iron, to rivet on, ₩ 1000 7 50 net
Neck Yoke Eyes, each....4½c net
" " with ⅝ rings, each....7½c net
King Bolts, ⅝, 1, 1⅛, and 1¼ in. diam....₩ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths.... " 8½c net
Wagon Rivets, 3-16 in. diam., all lengths.... " 9½c net
" & Nails, in 5 ℔ paper boxes....₩ ℔ 1c extra
" " in 25 ℔ wood " ....½c extra
Wagon and Hinge Nails, ¼ in....₩ ℔ 17 c net
" " " 3-16 in.... " 19 c net
Double Tree Plates.... " 8½c net
Coupling " .... " 5½c net
Tongue " .... " 9 c net
Neck Yoke Plates.... " 11 c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ₩ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in, ₩ ℔ 10½c net. ¼ in., 11½c. net

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal

IC, 10x14....	$11 50
IX, 10x14....	14 25
XX, 10x14....	17 00
IC, 12x12....	12 00
IX, 12x12....	14 75
IC, 14x20....	12 50
IX, 14x20....	15 25
XX, 14x20....	18 00
XXX, 14x20....	20 75
XXXX, 14x20....	23 50
DC, 100 Plate....	11 00
DX, "	13 45
DXX, "	16 50
DXXX "	19 25
DXXXX 100 Plate..	22 00
IX, 14x14....	23 50
IC, 10x14 W....	11 00
IX, 10x14 W....	13 75

Roofing Tin.—Best Char.

IC, Terne, 14x20....	$10 25
IX, " 14x20....	13 00
IC, Terne, 20x28....	
IX, " 20x28....	

Coke Tin.—

IC, 10x14 Coke....	$9 50
IX, 10x14, Coke	12 25
IC, 14x20, "	10 50

Sheet Zinc.—
Any width....9¾c
Copper.—
Sheathing....33c
Copper Bottoms....34c
Planished Copper.—
Sheathing, 14x48....41c
Boiler Size, No. 7....43c
" " No. 8....43c
" " No. 9....43c
Tinning ₩ sheet, 14x48....10c
" " No. 7....10c
" " " 8....9c
" " " 9....9 10c
Pig Tin.—
Large Pigs....29c
Small Pigs....29c
Bars....29c
Solder.—No. 1....17c
No. 2....16c
Bright Wire....dis 37½ %
Sheet Iron.—
No. 18 Am. Com....4 90
No. 24 Am. Com....5 00
Pat. Am. Russia "A,"
Nos. 24, 25 & 26....14½c
Russia, Nos. 9, 10, 11 & 12..13c
Pat. Planished Russia....c
Russia No. 9, 10, 11&12....c
W. D. WOOD'S & CO.'S SHEET IRON.—

Nos. 15 to 20 Smooth	$6 10
" 21 to 24....	6 50
" 25 & 26....	6 50
" 21 to 24 Char'l..	7 80
" 25 & 26 " ..	8 00

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Pardee, Bro. & Co.	LATTIMER.

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WM. MERSHON, Agent, 111 Broadway N.Y
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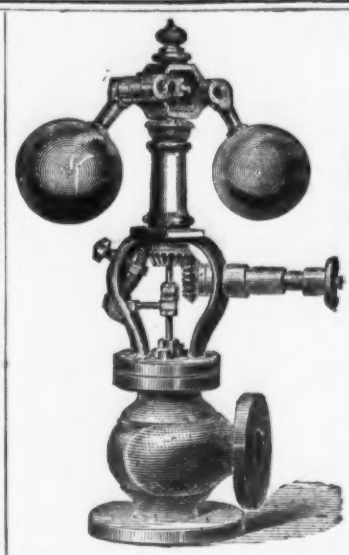

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Shive Governor Co
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SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR.
The Best and Cheapest Watcher of the Watchman made
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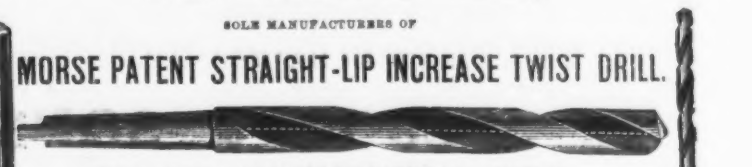

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EDWARD S. TABER, Treasurer.

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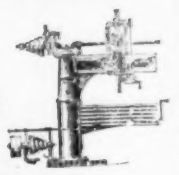
Radial, Horizontal,
Multiple, Special.



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Wood and Iron Working of every kind. Leather and Rubber Belting, Emery Wheels, Babbitt Metal, &c.
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Best and most perfect Shafting ever made, constantly on hand in large quantities, furnished in any lengths up to 24 feet. Also Patent Coupling and Self-Oiling Adjustable Hangers, Pulleys, &c.
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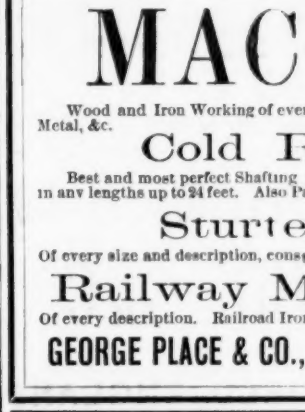
INGOT BRASS, BRASS CASTINGS.
Du Plaine & Co.,
1303 & 1305 Buttonwood St., PHILADELPHIA.



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Pointed, Polished & Finished Horse Shoe Nails.
Recommended by over 20,000 Horse Shoers.
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THREE CLASS PRIZE MEDALS, CLASSES 1, 21, 22, Great Exhibition of Industry, LONDON, 1851.

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Unsurpassed, if equaled in quality.

Bailey Lane Works, Sheffield, England.

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Warranted Most Superior for Tools and Granite Rock Drills.

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CLEVELAND, O., Cleveland, Brown & Co.
NEW ORLEANS, Rich'd Rhodes, 71 Camp.
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Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

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Cast and Double Shear STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

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In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed.

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Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for **Turning Tools, Taps, Dies, Drills, &c.**

Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

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Hammered and Rolled STEEL of every description

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CAST STEEL,

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All descriptions of **Cast and German**

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Elliptic and Side Springs, Seat Springs,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators, Reaper Bars, Mower Bars, &c., &c.

Warehouse, 83 Water and 100 First Streets.

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Minerva & Beaver Iron & Steel Works

Wolverhampton, England,

MANUFACTURERS OF

"Jenks" Spring Steel, Cast and Swedes Spring Steel,

TIRE, TOE CORK, SLEIGH SHOE, BLISTER & PLOW STEEL.

Also, Plow and other Iron.

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A full assortment of "Jenks" Spring Steel in stock.

MILLER, BARR & PARKIN,

Orescent Steel Works,

PITTSBURGH, PA.

Manufacturers of all descrip[illegible] of

STEEL

EQUAL TO ANY IN THE MARKET.

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Gunpowder.

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of all kinds and descriptions.

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MANUFACTURERS OF ALL DESCRIPTIONS OF

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FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

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BRANCH OFFICES:

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Pittsburgh Steel Works.

ESTABLISHED IN 1845.

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MANUFACTURERS OF

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MANUFACTURERS OF ALL KINDS OF

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Also, Springs, Axles, Rake Teeth, &c.

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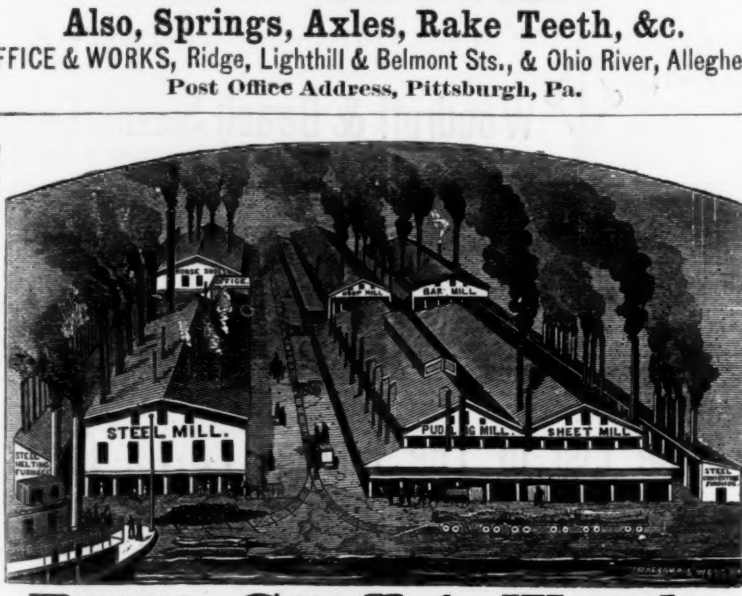

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Reese, Graff & Woods.

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CAPITAL - - $500,000.

Issues Policies of Insurance, after a careful Inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

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or at any Agency.

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New York Branch, No. 1 Park Place.

CHICAGO.

(Reported by Markley, Alling & Co.)

Agricultural Implements.—
Scythes—Dunn Edge Tool Co. ... dis 30 %
Hay and Manure Forks—Otsego extra C. S. ... dis 30 %
Hoes and Garden Rakes—Jackson and Otsego ... dis 30 %
Scythe Stones ... dis 25 %
Scythe and Bush Snathes ... dis 25 %
Harvest Rakes and Barley Forks ... dis 25 %
Revolving Horse Rakes ... dis 25 %
Handles—Fork and Shovel ... dis 25 %
Cradles—Nithington, Cooley & Co. ... dis 45 %
—Genuine Morgan ... ℘ doz net $34 00

Augers and Bits.—
Ives' extra C. S. ... dis 30 % | Snell's ... dis 10 %
Jennings' ... dis 5 % | " Car Bits ... dis 10 %
Cook's ... dis 30 %

Axes.—Amoskeag Yankee ... ℘ doz $12 00
Amoskeag Crescent ... " 13 00
Hunt's Bronzed ... " 12 00
Jefford's Silver Steel ... " 12 50
M. A. & Co. Clipper ... " 12 50
Mann's Red Warrior, Beveled ... " 12 50
" Double Bitt ... " 25 00
Handled Axes ... " 15 00
" " Boys ... " 12 00
Kennebeck ... " 11 00

Bolts.—Carriage and Tire ... dis 70 @ 10&5 %
Cast Barrel and Shutter ... dis 20&10 %
Wrought Iron Barrel ... add 10 %
" " Square ... net list

Butts.—Cast Fast Joint, Narrow ... dis 30 %
Cast Fast Joint, Broad ... dis 20 %
" Loose Joint ... dis 50&5 %
" " Pin, Reversible ... dis 40 %
" " Japanned ... dis 35 %
" " Silver Tipped ... dis 35 %
Wrought Narrow, Fast Joint ... dis 30 %
" Broad " " ... dis 30 %
" " Loose " ... dis 37 %
" Loose Pin ... dis 30 %
" Table ... dis 30 %
" Brass ... dis 10 %
Garretson's Blind Butts, Wood ... doz sets $1 75
" " Brick ... doz sets 2 75
Parker's " Wood ... doz sets 1 85
" " Brick ... doz sets 2 75

Casters.—Iron Plate ... dis 25 %
Brass Wheel Plate ... dis 25 %
Porcelain Wheel Plate ... dis 25 %
" " Bed ... dis 25 %
Iron Wheel Bed ... dis 25 %

Chisels.—Butcher's Tanged Firmer ... dis 30 %
" Long Paring ... dis 30 %
Witherby Socket Framing ... dis 50&20 %
" " Firmer ... dis 50&20 %
" " Corner ... dis 50&20 %
" " Slicks ... dis 50&20 %

Coffee Mills.
Box 4 Iron ... $3 75 | Box 85 Cast Steel ... $12 00
" 103 " ... 5 25 | Side 50 ... 4 75
" 102 " ... 6 25 | " 60 ... 5 75
" 107 Britannia ... 7 50 | " 70 ... 7 25
" 106 " ... 8 50 | " 90 ... 18 00
" 25 Union ... 10 50 | " 15 Union ... 7 00
" 35 " ... 12 00 | " 20 " ... 8 00
" 75 Cast Steel ... 10 50

Cutlery.—American Table ... dis 20 %
" Pocket ... dis 25 %

Door Springs.—Torry ... ℘ doz $5 00
Rubber ... " 4 00
Boon's ... " 5 00

Drawing Knives.—Witherby Tool Co. ... dis 50&20 %
Ohio Tool Co. ... net list

Files.—Butcher's ... $7 00 £
Nicholson's ... $5 00 @ $5 50 £

Hammers.— | Yerks & Plumb ... net list
Maydole's ... net list | Cheney ... net list

Handles.
Extra Axe ... ℘ doz. $3 00 | Coal Pick, No. 1 ... ℘ doz $2 00
No. 1 Axe ... " 2 25 | Sledge, No. 1 ... " 2 00
No. 2 Axe ... " 2 00 | Hatchet ... " 65
R.R. Pick, No. 1 " 2 00 | Hammer, A. E. ... " 65

Hatchets.—

	1	2	3
Amoskeag Shingling	$7 25	$8 00	$8 75
" Claw	7 75	8 50	9 22
" Lath	7 50	8 25	
" " Solid Steel			12 00

Hinges.—Strap and T ... dis 20&10 %
Screw Hook and Strap, 6 to 12 in. ... 8c. ℘ ℔
" " 14 to 24 in. ... 6½c. ℘ ℔
Hook and Eye Hinges ... net 12c. @ 16c. ℘ ℔
Gate, No. 35, State ... ℘ doz $3 50
" No. 3, In and Out ... " 3 50
" Blinn's Pat ... " 7 50

Hog Ringers.—Hill's Patent ... ℘ doz $6 00
Hill's Patent Rings ... ℘ 100, 25c
" Tongs ... ℘ doz $6 00

Horse Nails.—Northwestern, 8d ... 24c
Ausable, 8d ... 24c
Globe, 8d ... 26c

Kettles.—Brass ... 54c | Enameled ... dis 30&10 %
Locks and Knobs.— | EagleLock Co. ... dis 15 %
Norwalk Lock Co. dis 45 % | Am. Pad Locks ... dis 35 %
Branford " dis 45 % | Conti'al Lock Co. ... dis 10 %
Meat Cutters.— | Woodruff Patent ... net list
Haven's Patent ... net list | Stowe's Sausage
Hale's " ... dis 10 % | Stuffers ... net list
Molasses Gates.— | Enterprise Patent ... dis 5 %
Stebbin's Patent ... dis 50 %

Nails.—10d to 60d ... per keg $4 00

Oil Stones.—Washita No. 1 ... net 30c ℘ ℔
Washita Slips ... net 60c "
Hindostan No. 1 ... net 9c "
" Axe ... net 10c "
" Slips ... net 15c "

Picks and Mattocks.—Picks, Railroad, Axe Finish ... ℘ doz $12 00
Picks, Coal, Axe Finish ... " 10 00
Mattocks, L. C., Axe Finish ... " 15 00
" S. C., " ... " 14 50
Grub Hoes, Axe Finish, No. 2 ... 1 00

Planes.—Ohio Tool Co., Bench ... dis 3) %
Sciota ... dis 35 %
A. Howland & Co., Bench ... dis 30 %
" Fancy ... dis
Bailey Patent Iron ... dis 15 %
Plane Irons, Butcher's ... dis 30 %

Rivets.—Iron ... dis 10 @ 15 % | Copper, No. 7. net, ℘ ℔, 50c
Tinned ... dis 10 @ 15 %

Rules.—Stanley Rule and Level Co. ... dis 50&10 %
Hubbard & Curtiss Mfg. Co. ... dis 50&10 %

Sad Irons.—Best A No. 1 ... ℘ ℔, 4c
" Copper Face Star ... ℘ ℔, 4½c

Sandpaper.
Baeder & Adamson's No. 0 to 1½ ... per ream, net $4 50
" No. 2 to 3 ... " net 5 00
Wiggin& Stevens, No. 0 to 1½ ... ℘ ream, net, $4 50
" " No. 2 to 3 ... " " 5 00

Sash Locks.—Champion ... ℘ gross, net, $12 00
Hopkins & Dickinson ... dis 10 %
Judd's Patent ... dis 10 %
Corbin's Patent ... dis 10 %
Clark's Patent ... dis 20 %

Saws.—H. Disston & Sons ... dis 10 %
Champion X Cut ... ℘ foot, net, 60c
M. A. & Co. X Cut ... " " 50c
Lightning Cut ... " " 66c

Screws.—American Screw Co.—Iron ... new list dis 50 %
American Screw Co.—Brass ... dis 50 %

Shovels and Spades.
Ames' Black Shovels ... ℘ doz $14 50
" Polished " ... " 15 50
" Patent " ... " 18 00
Alling " " ... " 16 00
" " " Molders' ... " 18 00
Crane's Black " ... " 11 50
" Polished " ... " 12 00
Smith's " " B. S. L. H. Rd. Pt. ... " 13 50
" " " B. S. D. H. Rd. Pt. ... " 14 00
Ames' Black Spades ... " 16 00
" Polished " ... " 17 00
" Patent " ... " 17 50
Alling " " ... " 16 00
Crane's Black " ... " 12 50
" Polish'd " ... " 13 50

Scoops.—Alling Steel Polished, No. 2 ... ℘ doz, $13 50
Alling Steeled Polished, No. 3 ... " 14 00
" " No. 4 ... " 14 50
" " No. 5 ... " 15 50
" " No. 6 ... " 16 50
" " No. 7 ... " 17 50
" " No. 8 ... " 18 50
" " No. 10 ... " 21 50
Crane's Polished, No. 5 ... " 13 50
" No. 6 ... " 14 50
" No. 7 ... " 15 50
" No. 8 ... " 16 50
Crane's Black Coal, No. 4 ... " 17 50
" " No. 5 ... " 18 00
Preston, Black Scoops No. 1 ... " 12 00
" " No. 2 ... " 12 50
" " No. 3 ... " 13 00
" Half Pol. Scoops No. 1 ... " 12 50
" " " No. 2 ... " 13 50
" " " No. 3 ... " 14 50
Lippincott, Half Pol. No. 2 ... " 15 00
" " No. 3 ... " 16 00

Wrenches.—Taft's ... dis 60 %
Coe's Imitation ... dis 50 %
Coe's Genuine ... dis 35 %

Wringers.—Novelty Clothes Wringer ... ℘ doz $65 00
Universal Clothes Wringer ... " 69 00

Chicago Metal Market.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)

Tin Plate.— | 14x20, IX, Ch'l Best. $15 50
10x14, IC, Ch'l. Good. $ | 14x20, IXX, " " . 18 50
10x14, IC, " Best. 11 50 | 14x20, IXXX. " " . 21 50
10x14 IX, " " . 14 50 | DC, 100 Plate, " " . 11 50
12x12, IC. " " . 12 00 | DX. " " . 14 50
14x12, IX, " " . 15 00 | DXX, " " . 17 50
14x20, IC. " " . 12 50 | DXXX. " " . 20 50
Roofing IC, Charcoal, Best ... 11 00
Roofing IX. Charcoal " ... 14 00
20x28, IC, Charcoal Roofing, Com ... 21 50
20x28, IC, " Good ... 22 00
20x28, IC, " Best ... 22 50
20x28, IX, " " ... 26 50 @ 27 00
10x14, IC, Coke Plates ... 10 00
14x20, IC, " ... 10 50
10x20, IC, " ... 16 00 @ 17 00

Block Tin.—
Large Pigs ... 23c | Bars ... 30c
Small ... 29c | Straits, 2c. higher.

Zinc.—Sheet, 500 to 1000 lb. Casks ... 9¾c
Loose Sheets ... 10c
Slab Zinc or Spelter ... 6¾ to 7¾c

Copper.—Bottoms ... 33c
Sheathing ... 32c
Planished ... 37c
" Boiler lengths ... 39c
Ingot ... 24c to 26c
Bolt ... 40c

Braziers' Sheets.—
30x60, 6 to 10 lbs. ℘ ℔ 41c | 30x60, 15 to 100 lbs. ℘ ℔ 35c
30x60, 10 & 12 lbs. " 38c

Solder.—F. S. & Co.'s make.
Best Fine ... 22c | Roofing ... 18c
No. 1 ... 20c | Braziers' or Spelt. Sold. ... 35c

Antimony ... 18c

Babbit Metal—F. S. & Co.'s ... 16c
No. 2 ... 14c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata.
No. 24	4¾c	5¾c	7¼c	9¼c
25 & 26	5 c	6 c	7½c	9½c
27	5¼c	6¼c	7¾c	9¾c

Galvanized Iron ... dis 20 %
No. 16 to 20 ... 12c | No. 27 ... 15c
21 to 24 ... 13c | 28 ... 16c
25 & 26 ... 14c

Russia Iron.— | No. 1 Stained ... 19c
Perfect ... 20c | In Sheets, 1c. higher.
American Russia.— | B ... 12c
A ... 15c | In sheets, 1c higher.

Lead.— | Lead Pipe, in full coils .8½c
Pig ... 7½c | Lead Pipe, when cut ... 8¾c
Bar ... 8½c | Sheet Lead ... 8½c

Wire—Bright ... dis 30 %
Coppered ... dis 25 %

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.)

Apple Parers.—Reading ... per doz $8 00
Augers.—Watrous Ship ... dis 10 %
L'Hommedieu Ship ... dis 15 %
Axes.—Forester's Favorite, Bronzed ... $12 50
Blue Jackets, Blue ... 12 00
Excelsior, Black ... 11 50
Chopper's Pride, Bronzed ... 11 00
Red Cross, Red ... 10 50
Red Cross, Handled ... 12 50
Boy's Handled Blue Jackets ... 12 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2·50. B (No. 1) $2·00. C (No. 2) $1·50 ℘ doz
Blind Hinges.—Washburn's ... per hundred set $9 50
Blind Fasts.—Washburn's ... per hundred set $5 75
Bolts.—Carriage, Phila., " Girard Works ... dis 50&10 %
Borax.—Best Refined ... ℘ ℔ 16c
Borers.—Angle, Backus' ... dis 30 %
Boring Machines.—Angle ... each $4 75
Common, Snell's quality ... each 3 75
Braces.—Barber's ... dis 40&5 %
Backus' ... dis 50 %
Spofford's ... dis 40 %
Brass Faucets.—L. F. & C. ... dis 25 %
Butts.—Union Drilled Loose Joint ... dis 60&10 %
" " Wire Fast Joint ... dis 55 %
" " Acorn Loose Joint ... dis 60&10 %
Brass Butts ... dis 30 %
Wrought Table Butts and Back Flaps ... dis 30 %
Wrought Narrow Butts ... dis 30 %
Cartridges.—" U. S. Cartridge Co." ... dis 50 %
Chisels.—"Buck Bros." Shank Goods ... add 20 @ 22½ %
Socket ... add 22½ @ 25 %
Compasses and Dividers.—Bemis' ... dis 35 %
P. S. & W. ... dis 25 %
Cordage.—Manila (usual trade dis.) ... ℘ ℔, 16c
American Tarred Hemp Lath Yarn ... ℘ ℔, 10c
Corn Hooks ... per doz $2·75
Crow Bars.—Iron, Steel Points ... ℘ ℔, 5¾c
" Sweet" Steel Bars ... ℘ ℔ 11c
Brown's Steel Bars ... ℘ ℔ 10c
K. P. & Co. Extra Drill Steel ... ℘ ℔ 15c
Dividers.—Cook's Nickel Plated ... dis 15 %
Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12·00 ... dis 25 %
No. 8, " outside " $18·00 ... dis 25 %
Torrey's ... $4·00
Emery.—Alden ... ℘ ℔ 7c
Wellington Mills ... ℘ ℔ 10c
Files.—Earl Smith & Co.'s English ... $5 to £ gold
American ... $5 to £ currency, less 12½ %
Nicholson ... $5 to £ currency, less 1.½ %
" Regular Taper ... dis 12½&5 %
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·62; 4, $1·88; 4½, $2·13; 5, $2·50.
Funnel Irons.—$2·50 2·50 2·50 3·25 per doz
5, 5½, 6, 7 inch.
Deep Flange.—$3·50 3·75 4·00
5, 5½, 6 inch.
Hammers.—Maydole ... dis 5 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $9·75
" " " " " " bell face, No. 1, $11; 1½, $9·75.
Hangers & Rollers.—Novelty ... dis 30 %
Anti-Friction ... $1 25 per pair—dis 30 %
Hatchets.—Underhill Edge Tool Co. ... dis 10 %
C. F. Dowse, warranted Cast Steel—
Shingling ... 0, $4·75; 1, $5·25; 2, $5·75
Claw ... 1, 5·75; 2, 6·25
Lathing ... 1, $5·50
Axe Pattern ... 1, $7·00; 2, 7·50
Broad ... 0, $5·75; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75.
Hinges.—Strap and T, Stanley Works ... dis 20&10 %
Plate, Loose and Fast Joint ... ℘ ℔ 7½c
Wrought Screw Hook ... ℘ ℔ 8c
Hoes.—Ely Balch & Co. M., B. & D.'s list, 1874 ... dis 25 %
Remington, M., B. & D.'s list, 1874 ... dis 30 %
Lead.—Sheet and Pipe ... 7½c—less 10 %
Locks.—P. & F. Corbin ... new list dis 45&5 %
Nashua ... dis 45&5 %
Manure Forks.—
Myers & Ervien, M., B. & D.'s list, 1874 ... dis 25 %
Peck, Clark & Co., " " ... dis 25 %
Shumway & Co., " " ... dis 30 %
Mattocks.—K. P. & Co., axe finish, long cutter ... $13 75
Short cutter ... 13 50
Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ℘ ℔
Nails.—10d and larger ... $4 00
Padlocks.—Wilcox ... dis 50&2 %
All Brass, 2¾ inch, 2 keys, job lot ... $9 00
Picks.—K. P. & Co., Polished Points—
5 to 6 ... per doz $9 00; 6 to 7, $9 50
Pins.—Universal Hat and Coat all wood—
2 in. ... ℘ gross $2 50; 3 in., 3 50; 4 in., 4 50—dis 25 %
Potato Digger.—
" Partridge," 6 square tine ... ℘ doz $12 00
Shumway & Co., 6 round tine ... ℘ doz 9 00
Pulleys.—Clark & Co.'s Axle, 2 in. ... per doz 42c
Plated Ware.—Rogers Bros. ... new list dis 40&10 %
Plumb & Levels.—" Davis" Pat. Adjustable—
No. 1, Iron and Wood Center Levels ... dis 50 %
No. 2, First Quality Levels ... dis 60&10 %
No. 3, Iron Pocket " ... dis 35 %
No. 4, Level and Plumb Glasses ... dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge ... dis 50&10 %
No. 6, Improved Iron Bench Planes ... dis 20&10 %
Pocket Knives.—Conn. Cutlery Co. ... new net list
Rakes.—Cast Steel, garden ... dis 30 %
Malleable ... dis 25 %
Rail Barn Door.—For Novelty and Anti-Friction Hangers ... per foot 7c., dis 30 %
Rivets.—Black ... dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8,
13 13 14 14 15 16c ℘ ℔ net
Sad Irons.—Bless & Drake ... ℘ ℔ 4
Sand Paper—0 to 2, $4·25; 2 to 3, $4·75 ... dis 10 %
Saws.—Disston's ... dis 12½ %
Lightning X cut, Boynton's ... per foot 67c
" Saw Blades, 32 inch ... per doz $7 00
" Framed Saws ... per doz 8 50
Common " ... per doz 6 00
Disston " " ... per doz 9 00
One man X cut.—Lightning ... $2 75 each
Disston's $3·00 each ... dis 12½ %
Wheeler, Madden & Clemson ... dis 15 %
" " " Mill ... dis 25 %
" " " Circular ... dis 25 %
Screws.—American Screw Co. ... revised list dis 52½ %
Scythe Stones.—
" Willoughby Lake," first quality ... ℘ gross $6·50
" " second quality ... 3·00
Shovels.—O. Ames ... new list dis 12½ %
M. B. & D. ... new list dis 12½ %
Spading Forks.—M. & E. ... dis 25 %
Stone Pickers.—" Partridge," original ... ℘ doz $15 00
Tools.—Aiken's Pattern, 20 in set; Parr's ... $4·00 per doz
Traps.—Oneida ... dis 20&5 %
Blake's ... dis 50 %
Vises.—K. P. & Co.'s Solid Box, Blacksmith ... ℘ ℔ 13c
Parker's Parallel ... dis 10 %
Backus ... dis 25 %
" Howards," Parallel ... dis 20 %
Wardrobe Hooks.—Wire to drive ... ℘ gross $1 00
Weights.—Window Weights ... ℘ ℔ 2¾c
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black ... ℘ ft 6c
Wrenches.—Genuine Wrenches, A. G. Coes ... dis 40&5 %
Wringers.—
Novelty and Universal } Tub No. 2 } ... market unsettled
Eureka ... per doz $60 00
Novelty Bench, No. 4 ... market unsettled

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz.)

Tin Plates.—℘ box | **Copper.**— ℘ ℔
I. C. Char. 10x14 @ $10 00 | Sheathing ... 33c
I. C. Coke 10x14 ... 9 50 | Bolt ... 36c
Char. Roof. IC, 14x20, 11 25 | Ingot ... 20½c
Coke " IC, 14x20, 10 25 | **Lead.**— ℘ ℔
Pig Tin.— ℘ ℔ | Pig ... 6¾c
Banca ... 30c | Sheet and Pipe ... 7·2c
Straits ... 28c | **Spelter** ... ℘ ℔ 8c
English ... 24c | **Antimony** ... ℘ ℔ 14c
Zinc.—Sheet ... ℘ ℔ 9¼c
Iron.—Sheet Iron, Russia ... " 18c
Sheet Iron, English ... " 5 c
" " American Refined ... " 5¾c
" " Galvanized ... " 10c
Plate Iron ... " 4
Swedish and Norway Bar Iron, gold ... ℘ ton, $122 50
" " " Shapes, gold ... 180 00
Norway Nail Rods, first quality, gold ... 145 00
" second " " ... 135 00
Best Refined Bar Iron ... 67 50
The " Burden Best" Iron ... 106 4?
American Pig Iron, Foundry, No. 1, x ... 35 00
" " " No. 2, x ... 33 00
" " Gray Forge ... 30 00
Scotch Pig Iron ... ℘ ton 37 00 @ 40 00
Wrought Scrap Iron ... 35 00
Steel.— ℘ ℔ | German ... 10½c
Eng. Tool ... 18c | Spring ... 8½c
American Tool ... 15c | Tire ... 6½c
" Mach ... 10½c | Sleigh Shoe ...
Bessemer ... 7½c | Toe Calk ... 7½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co

Anvils.—Armitage ... ℘ ℔, gold 12c
Peter Wright's ... " 14c
Wilkinson's ... " 12½c
Apple Parers.—Conqueror ... ℘ doz, $9 00
Lightning ... 9 00
Turn Table ... 9 00
Axes.—Hunt's ... ℘ doz $13 00 @ 13 50
Lippincott's ... " 12 00 @ 13 00
Lippincott's Pioneer ... 13 00 @ 13 50
Simmons' ... " 12 00 @ 13 00
Axles.—Kritch & Crane Mfg. Co.'s—
Patent Taper Axles ... new list net
Swelled Taper Axles ... new list net
Concord Axles ... new list net
Red Jacket Axles ... new list net
Common Axles, 1½ inch and upward ... ℘ ℔ 8½c
" " less than 1½ inch ... " 8¾c
Bellows.—" Best St. Louis make" 60c ℘ in. dis 20 %
Bells.—Troy, Church ... ℘ ℔, 30c
Light Brass Hand ... dis 50 %
Moore's, Cow ... dis 20 %
Bolts.—Arms, Bell & Co.'s Machine ... dis 20 %
Arms, Bell & Co.'s Carriage and Tire ... dis 75 %
Cast Butt Hinges.—Western Butt Co.'s—
Narrow Fast Joint ... dis 35 %
Broad Fast Joint ... dis 50 %
" Loose " ... dis 60 %
Reversible ... dis 50 %
" Japanned and Silver Tipped ... dis 45 %
Loose Joint " Acorn " " " ... dis 55 %
Lull & Porter's Blind ... dis 50 %
Wrought Butts.—Narrow ... dis 25 %
Reversible ... dis 30 %
Broad ... dis 30 %
Chain.—Eng. Coil. 3-16 ¼ 5-16 ⅜ 7-16 ½ in.
15 11 10 9½ 9 8c gold
Trace ... 6½-10-2 c "
7-10-2 7c "
German Coil and Halter ... revised list add 10 %
Chisels.—Socket, Firmer or Framing ... dis 60 %
Clothes Wringers.—Crown ... ℘ doz $60 00
Novelty ... " 69 00
Universal ... " 69 00
Monitor ... " 69 00
Corn Cutters or Hooks.—Solid Steel ... ℘ doz $4 00
Corn Knives.—Dunn Edge Tool Co.'s Clip ... ℘ doz $5 75
Disston's ... " 6 00
Crow Bars.—Steel Pointed ... ℘ ℔ 7c
Cutlery.—J. Russell & Co.'s ... } new list, dis 15 %
Lamson, Goodnow & Co.'s ... }
Landers, Frary & Clark's ... }
Files and Rasps.—
Nicholson's Files ... $5 00 less 5 %
Butcher's Mill ... $6 75
Heller's & Bros Horse Rasps ... dis 40 %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks ... dis 70 %
" " Handled Hoes ... dis 30 %
" " Planter Eye Hoes ... add 15 %
Winsted's Planter Eye Hoes ... add 15 %
Hammers.—Yerkes & Plumb ... dis 5 %
Masons' Hammers ... ℘ ℔ 20c
Smith Hand Hammers ... " 23c
Handles.—Axe ... Extra. $2·75 No. 1. $2·25 No. 2. $1·75 No. 3 $1·00
Pick ... Extra. $2·50 No. 1. $2·00 No. 1½ $1·75 No. 2 $1·25
Smith & Montross Fork, Hoe and Rake ... dis 20 %
Harrow Teeth.—1 inch iron ... ℘ ℔ 4½c
¾ and ⅞ inch iron ... " 4¾c
⅝ inch iron ... " c
Barbed or Headed ... ½c extra
Hatchets.—Hunt's ... dis 10 %
Simmons' ... dis 15 %
Hay Knives.—Lightning ... ℘ doz $20 00
Dunn Edge Tool Co.'s ... ℘ doz $14 50—dis 15 %
Fisher's ... " 16 50—dis 10 %
Hinges.—Strap and T—St. Louis make ... dis 25 %
Horse Nails.—Ausable ... 22c rates
Northwestern ... 22c "
National Patent Pointed ... 21c "
" " " Extra Finished ... 22c "
Horse Shoes.—R. I. (Perkin's pat.) ... ℘ keg $6 5
Burden's ... " 6 50
Mule Shoes ... " 7 50
Rhode Island Trotting Shoes ... " 9 00
Locks and Latches.—
Jones & Nimick's ... revised list dis 40 %
Moorhead, Adams & Co. ... revised list dis 40 %
Norwalk Lock Co.'s ... revised list dis 40 %
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks ... ℘ doz. $14 75 @ 15 25
" Grub Hoes, Oval Eye ... ℘ doz. 10 75 @ 12 00
Nails.—Wheeling ... $3 75 rates.
Orders for 100 kegs 10c ℘ keg less.
Picks.—Klein, Logan & Co.'s R. R. and Clay ℘ doz. $11 00
Klein, Logan & Co.'s Coal ... " 8 50
" " Poll ... " 11 00
" " Stone ... " 14 50
" " Tamping ... " 17 00
Planes.—Ohio Tool Co.'s ... dis 30 %
Sciota ... dis 40 %
Post Hole Augers.—Clark's Patent—
No. 1, ℘ doz. $27; No. 2, $30; No. 3, $32 ... dis 20 %
Barton's Patent ... ℘ doz $25—dis 20 %
Vaughn's " ... " 25—dis 10 %
Sad Irons.—Monitor Brand, Silver Polished ... ℘ ℔ 4c
Sash Weights.—Standard Solid Eyes ... ℘ ℔ 3¾c
Saws.—Disston's ... dis 10 %
Hubbard, Lippincott, B. & Co.'s ... dis 10 %
Branch, Crooks & Co.'s ... dis 15 %
Livingston's Patent Buck ... net list
Screws.—American Screw Co.'s revised list ... dis 50 %
Scythes.—
Dunn Edge Tool Co.'s ... new list dis 25 %
Paris Furnace Co.'s ... dis 30 %
Scythe Stones.—No. 1 Ind'n Pond ℘ gr's, $7 00 }
Extra Indian Pond ... " 7 50 } dis 25 %
Premium ... " 9 50 }
Diamond Grit ... " 13 50 }
Shovels, Spades and Scoops.—
Ames' ... dis 7½ %
Lippincott's ... dis 20 %
Rowland's Maxwell ... revised list dis 15 %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished ... ℘ ℔, 15c
Solid Cast Steel ... " 3?c
Snaths and Cradles.—Seymour Mfg. Co.'s ... dis 25 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express ... dis 10 %
Blue Seat Springs ... new list dis 15 %
Tacks.—Norway Tack Co.'s ½ weight ... dis 72½ %
Brads ½ weight ... dis 50 %
Thimble Skeins.—Pump & Skein Co.'s ... dis 50&10 %
Traps.—Newhouse Patent ... dis 15 %
Vises.—Solid Box ... ℘ ℔ 16c
Wilson Mfg. Co.'s ... dis 15 %
Wrenches.—Coes' Genuine ... dis 33⅓ %
Coes' Pattern ... dis 30 %
Taft's ... dis 60 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co,

Tin Plate.
IC, 10x14, Char $11 00@11 50 | IX, continuous,
IX, 10x14, " ... 14 50 | 20 in. x 200 ft ...
IC, 12x12, " ... 12 00 | IC, 10x14, best
IX, 12x12, " ... 15 00 | Coke ... $10 50 @ 11 00
IC, 14x20, " ... 12 50 | IC, 10x14, good
IX, 14x20, " ... 15 50 | Coke ... 10 00
IC, 14x20, Tern. $10 75 @11 00 | IC, 10x20 ... 17 00
IX, 14x20, " 13 00 | IC, 14x20 ... 10 00
IC, 20x28, " 21 50@22 00 | IC, 14x20, Coke Lead. 9 50
IX 20x28, " 25 50@26 00 | IC, 10x14, punch'd for
IC, continuous, | Safes ... 10 00
20 in. x 200 ft ...
Block Tin.
Large Pigs ... 28c | Bars ... 30c
Small " ... 29c
Sheet Zinc.
Casks ... ℘ ℔ 9¾c | Sheet ... ℘ ℔ 10½c
Solder.
No. 1, Refined, in bars or plate ... $17 00 @ 18 00
No. 2, " " " ... 16c
Pig Lead ... 7½c
Sheet Copper.—18 to 100 lbs. Sheets 30x60 ... 32c
14 to 16 lbs., Sheets 30x60 ... 32c
10 to 12 lbs., " and 20x72 ... 35c
6 to 9 lbs., " ... 38c
Tinned, 14 and 16 oz. 14x48 ... 31c
Planished, 14 and 16 oz. 14x48 ... 37c
" No. 7, 8 and 9 ... 39c
Copper Bottoms ... 33c

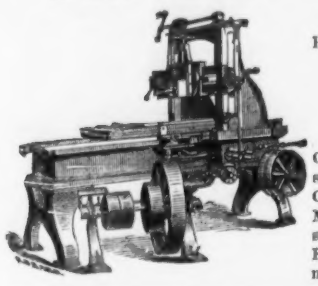
Sheet Iron.—

	Com'n.	Sm'th.	Char'l.	Jun'ta
No. 16 to 20	4½c	5½c	7¼c	9¼c
No. 22 to 24	4½c	5½c	7½c	9¼c
No. 26	4¾c	5¾c	7¾c	9½c
No. 27	5 c	6 c	7¾c	9¾c

Galvanized Iron ... dis 20 %
Iron Rivets ... dis 25 %
Iron Wire ... dis 35 %
Coppered Market Wire ... dis 30 %
Copper Rivets and Bars ... dis 20 @ 25 %
Russia Iron.—Nos. 9, 10, 11 and 12. ℘ ℔ ... 20c
No. 1 stained, ℘ ℔ ... 18c
Imitation Russia, ℘ ℔ ... 15c
Retinned Stamped Ware ... dis 25 %

The Pratt & Whitney Co.,

Hartford, Conn.,



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Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

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MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order.

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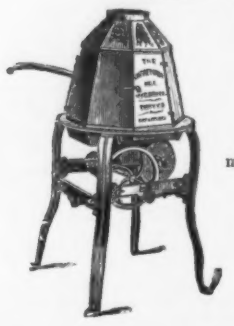


With or without Hood.

(Patented Nov. 25, 1873.)

WITHOUT BELTS OR BELLOWS.

It is more **Easily Worked,** gives a **Better Blast,** and is the **Cheapest** Forge made.

☞ **IT HAS NO BACK DRAUGHT.**

Manufactured by W. P. KELLOGG & CO., Troy, N. Y.

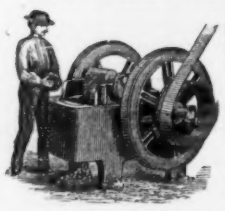
Also **Curry Combs, Boring Machines, & Cooley's Whip Racks, etc.**

N. Y. Depot for **Curry Combs,** &c., with **F. WIEBUSCH, 84 Chambers Street.**

N. Y. Depot for **Forges,** with **GEO. PLACE & CO., 121 Chambers & 103 Reade Streets.**

BLAKE'S PATENT STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds o hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS It is extensively in use in MINING operations, for crushing

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Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

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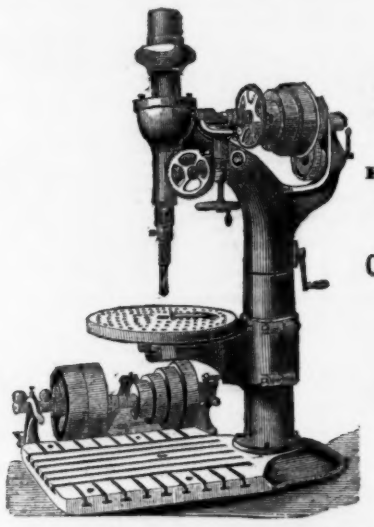

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From twelve (12) to forty-eight (48) inches swing;

Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press for Mandrels: **Grindstone Boxes.**

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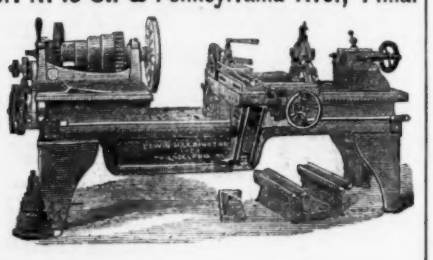

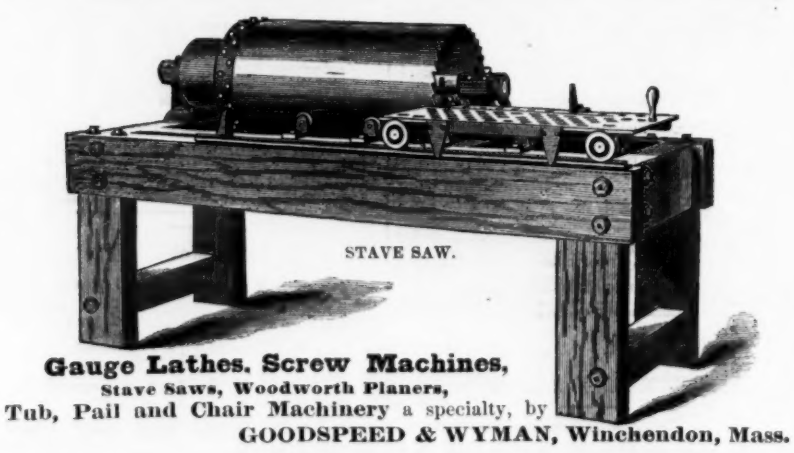

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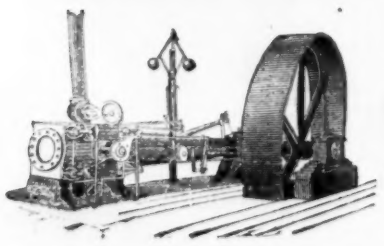

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Engineers, Machinists, Founders,

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Stationary Engines, Shafting, Mill Gearing, Hoisting Machines, Improved Piston Packing and Machinery.

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Of all descriptions and for all purposes, of any proportion or size, for pumping Hot, Cold, Fresh, Salt, Muddy or Gritty Water, Grain-mash, Syrups, all kinds of Beer, Acids, Molasses, and all heavy and thick fluids. Also for Feeding Steam Boilers, Supplying Tanks, and for Sugar Refineries, Tanneries, Oil Refineries, Gas Works, Hotels, Breweries, and for all classes of manufactories; for Draining Mines and Excavations, and for Rolling Mills, Blast Furnaces and Water Works supplying Cities, Towns and Villages with Water; also, for Wrecking purposes and Steam Fire Engines for Land and Sea.

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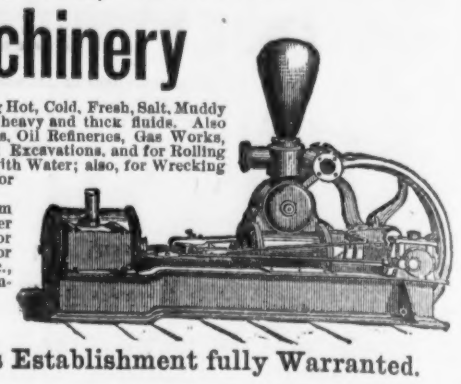
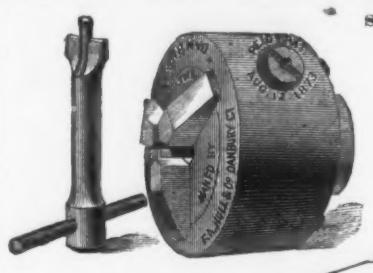


All Work from this Establishment fully Warranted.



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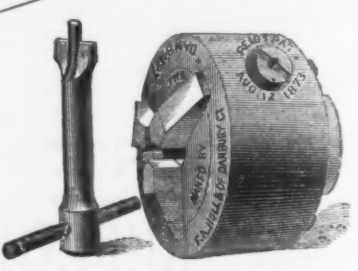
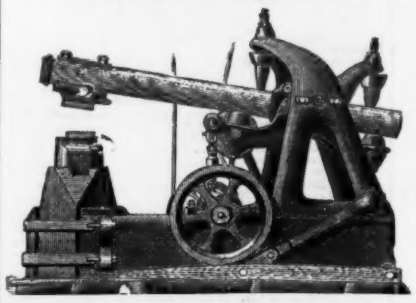


C. H. Reid's Patent, Aug. 12th, 1873.

BRADLEY'S CUSHIONED HAMMER.



This Hammer has many valuable improvements made useful in the device for cushioning the blow, thereby relieving all the working parts from that jar and concussion which is the destroying element of other Helve Hammers. It is made Adjustable in Line of Action, Length of Stroke, Rapidity of Motion, and Weight of Blow, all of which are controlled at the will of the operator. They have ***Larger Capacity, Cost Less,*** are more ***Durable,*** take up ***Less Room,*** o ***More*** and ***Better Work*** at ***Less Expense*** for Power, than any othe Hammer in use. We guarantee them fully as recommended. For particulars, address

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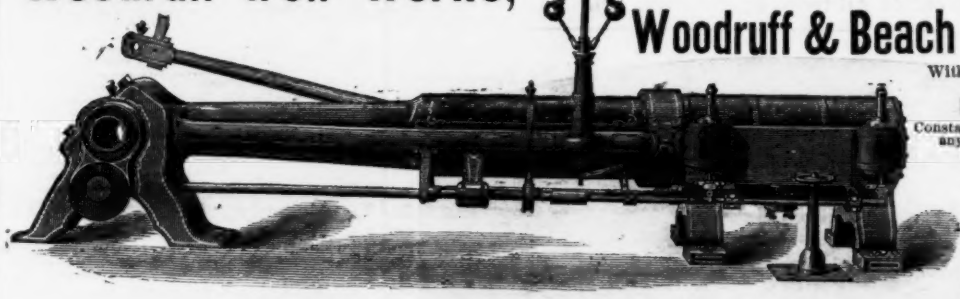

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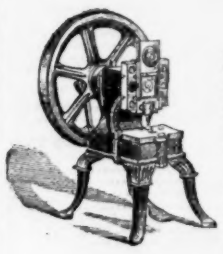

Number.	00	0	1	1½	2	2½	3	Tinners.	Tinners.	Tinners.	Tinners.	Boiler.
Price, with all improvements.....$	100	150	200	250	300	400	500	400	600	800	500	400
Price, without Patent Adjustment.....$	85	130	175	220	265	360	450	375	550	750	460	375
Price, without Patent Adjustment or Automatic Stop.....$	75	120	165	210	250	345	435	360	460	735	445	360
Size of opening in bed.....in.	2x2	2x4	4x7	5x8	6x9	7x10	8x11	12 dia.	20 dia.	26 dia.	14x20	2x2
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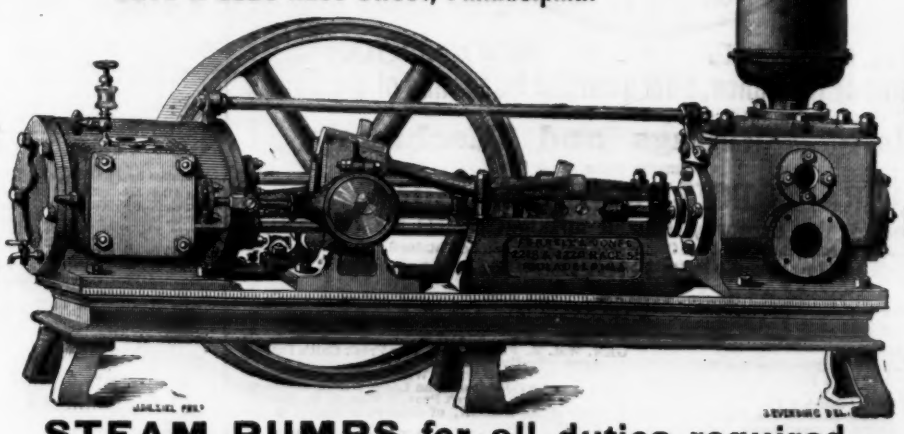

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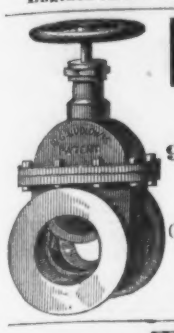

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COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.
$200·00.
Cheaper than any Engine offered of the same capacity.
MANUFACTURED BY
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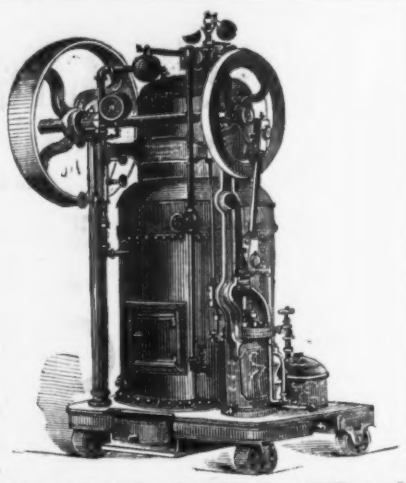
Binghamton, N. Y.



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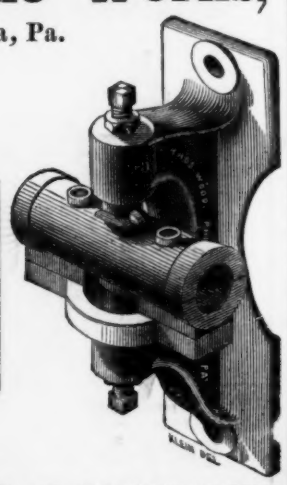

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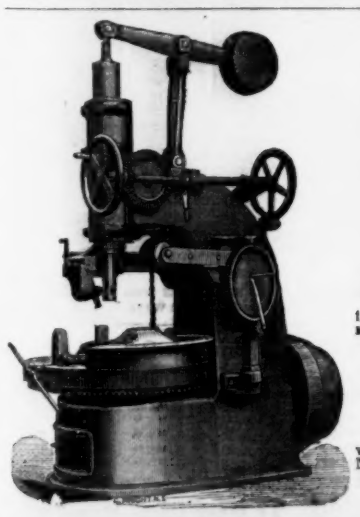
MANUFACTURES AS SPECIALTIES.
POWER LOOMS, with (new) Patent Box Motion. SPOOLING, BEAMING, DYEING and SIZING MACHINES.
BOBBIN WINDING MACHINES—wind direct from hank or skein to shuttle bobbin.
SHAFTING, with Patent Adjustable Self-Oiling Bearings.
PLANS taken, and FACTORIES fitted out complete with Shafting and Gearing.
PULLEYS, from 4 inch to 10 feet diameter, of most Approved Pattern.
SELF-ACTING WOOL SCOURING MACHINES, (Yewdall's Patent.)
Machine and Foundry Work in all their branches. Send for Price List of Pulleys & Shafting.



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MACHINISTS' TOOLS
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Pressure Blowers, Fan Blowers
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10,000 SOLD IN SIX YEARS.
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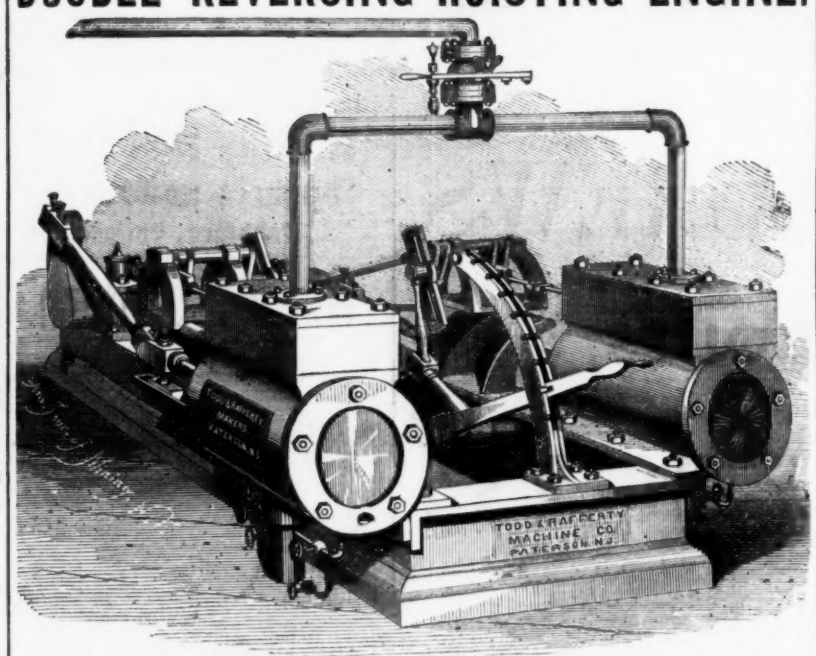

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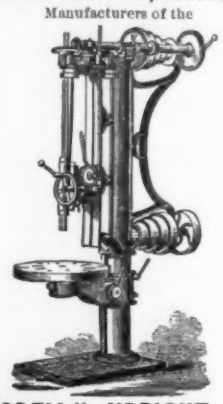

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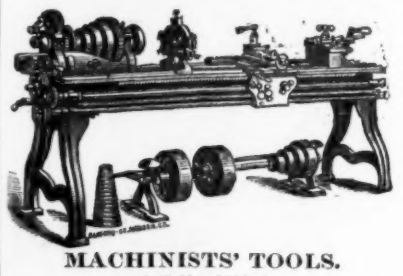

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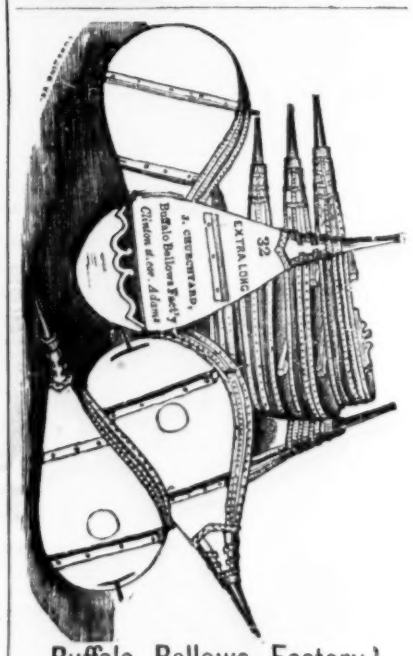

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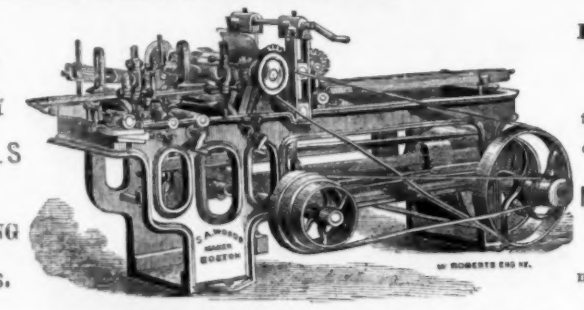

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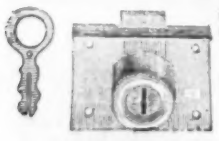

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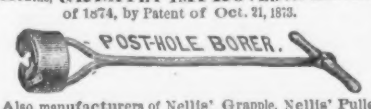

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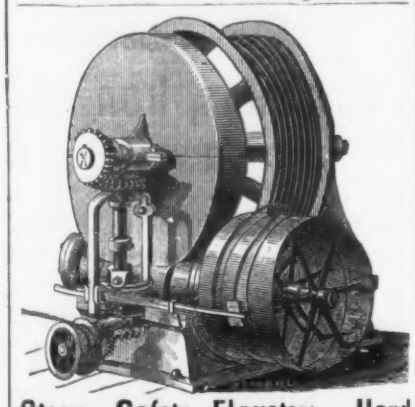

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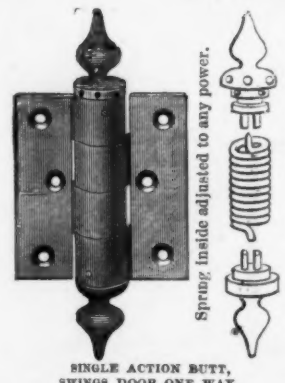

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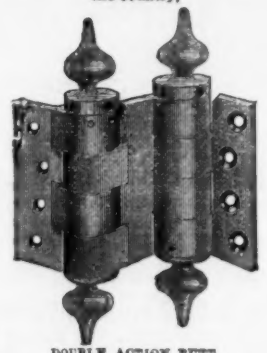

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